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THE OSTEOPATHIC LESION.

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Osteopathic science has been taught for over a decade. During this entire period little has been accomplished in original scientific research work either to prove or disprove the theory of the osteopathic lesion. We have rested somewhat contentedly, and apparently in several instances have felt our theory proven, by exhibiting clinical evidence only. Beyond question clinical results are real results, in fact, indisputable evidence, and in this practical age no one may gainsay the force and logic of such factors. But clinical data is only one means toward the end of scientific therapeutic demonstration. From one phase of the problem it is an end product, a finished product of a medical system; specifically it is the portion that appeals to the layman, and answers the immediate questions of the physician.

Still clinical evidence does not contain all the data upon which the osteopathic theory has been built. Our physicians have paid strict attention to the experiments and investigation of physiologists and pathologists. Facts wherever found are always acceptable. Like other systems of healing our science is based upon "chemistry, anatomy and physiology—not a smattering that is impossible, but with the great principles based upon them."[1] Our interpretation of parts of these principles is not the same as the physicians of other schools; it is well known that the significance or meaning of a fact may be misinterpreted and the lesson to be learned misapplied.

We have been fortunate in having good theorists in the osteopathic school. Theoretical knowledge is a necessity, and it has been said a "theory, in its proper use, signifies the highest form of knowledge." Our theorists' writings have been one great means of presenting osteopathic science to the public. Then theoretical writing supplemented by practical demonstration have been media that have courted and won public favor. Even if theoretical knowledge represents so very much, we should remember that the framing of a theory does not imply that all the links of the logical chain have been supplied.

At no period of medical history have physicians of all schools felt more keenly the futility of medical methods and the lack of an all-embracing principle of medicine than at the present. A recent writer who claims to have discovered a principle that encompasses the entire field of medicine

says: "We found, we may say, that the backbone of medicine was the absent factor, and that if the patient labors of so many great minds had not proven as useful in the development of practical medicine as they should, it was because they lacked such a fundamental frame-work to afford a fixed *nidus* for each discovery, wherein its true relation to other discoveries would at once become evident."[2]

Since the very conception of osteopathy its fundamental frame-work has not changed one iota as to principle, although the application of the principle has greatly broadened.[3] When Dr. Still proclaimed that "the rule of the artery is supreme" he gave utterance to a basic physiological truth. But only when he added that the living body contained all the attributes of a vital and physical mechanism did his teaching contain the germ of a comprehensive philosophy; this gave osteopathic medicine a backbone with a consequent fixed *nidus* for all existing facts and future discoveries. Hence, mechanical readjustment of the component parts of the vital body is the keynote of the osteopathic school of healing.

A study of symptomatological phenomena and of pathologic changes are only links of disease processes. Without question the physician should be conversant with these phases of perversion, but his knowledge must not stop here, for in the very order of things there is a first cause. Then it the cause of causes can be detected and its removal accomplished, the treatment of disease is placed upon a rational and logical plane.

This, then, is what the study of the osteopathic lesion brings us to—a consideration of the forces back of the disturbed function or of the diseased cell.

LESION DEFINED.

Broadly speaking, a lesion is "any morbid alteration in a tissue, whether attended by a recognizable structural change or not; but especially a change in which the continuity of some of the tissue elements is broken in upon."[4] There are many kinds of lesions expressing the tissue involved character of degeneration, locality of same, etc. But upon analyzing the medley of arbitrarily defined lesions the morbidly altered tissue must be first disturbed, generally speaking, through some alteration of the governing and controlling tissues of the body, viz: the nervous tissue. Here, then, in the broadest sense, should be the starting point of investigation. No one will question that with subsidiary tissues (subsidiary from anatomical and physiological grounds) a lesion may be initiated; still our premises first demand generalities before sub-division with the relation of the part to the whole are considered.

Dr. Hulett defined the osteopathic lesion as "any structural perversion which by pressure produces or maintains functional disorder."[5] The osteopathic conception of a lesion, functional disorder caused by pressure from disturbed structures, does not bring us into an absolutely new field. Medical literature of all ages contains references to diseases caused by pressure of tissues on blood vessels, nerves or other channels. But the osteopathic idea is an absolutely new one in the application of this principle universally. It simplifies and makes uniform the arbitrariness of present semeiology.

Thus the osteopathic idea that many diseases originate, primarily, from anatomically mal-aligned, mal-positioned, or mal-related tissues causing a

blockage of vital processes, immediate or remote, is a theory inclusive of disturbances to all tissues. This principle is fundamental and is supported by the physiological truth that uninterrupted vital channels preserve health. It at once places the interpretation of a lesion in an entirely new light from preconceived medical concepts, and is analogous to and co-extensive with etiology.

The object of this paper is to bring data (anatomical, physiological, pathological, clinical and experimental) to bear upon this conception and interpretation of the osteopathic lesion. We do not intend to cover the entire field of the osteopathic lesion, for that would imply extensive time and space, in fact, practically the field of pathology. One medium has been chosen in our study of the osteopathic lesion which we believe presents a typical standard for all the media. Indeed, we have chosen a study of the effect of the osteopathic lesion upon the nervous system as offering the most important field for investigation, as the nervous system is conceded to be the governing and controlling medium of the tissues.

First, then, we should gather a few facts relative to the anatomy and histology of the nervous system.

Second, we should note what data there is bearing upon the osteopathic concept from the viewpoints of nervous physiology and pathology.

Third, what osteopathic experimental evidence we have to offer.

All of this should have a direct bearing upon the osteopathic lesion concept of the nervous system, viz: the effect of mechano-anatomical pressure upon the integrity of the neurone.

ANATOMY AND HISTOLOGY OF THE NEURONE.

The neurone is an elementary body or the physiological unit of the nervous system. The older anatomists placed much significance upon the difference in arrangement of the gray and white matter of the central organs. Knowing that the gray mass was made up of cells and the white matter of nerve fibers, the disposition of these parts received much attention. Recent study and investigation has shown that the gray and white matters are different parts of the same unit; the gray matter being the central body and the white fibers distal portions of the elementary body. Thus the location and grouping of the neurones are of vast importance.

Neurones are divided into two classes; the central neurone and the peripheral. This division is dependent upon their embryological origin. The central class of neurones belong to the central nervous system proper, their conductivity being in a centrifugal direction; while the peripheral class belong to the sensory system, and the direction and conduction is centripetal. The cell of the anterior horn of the spinal cord is a typical efferent root representing the first class; and the afferent root of the posterior spinal ganglion represents the second class.

Each neurone is inclusive of cell body, dendrites or protoplasmic processes, and the axone or axis-cylinder process. Thus the ganglion-cell with all of its processes, irrespective of their number, length, function, complexity and relation, is considered a physiological unit. This is the unit of the "neurone theory" and seems to cover more of the facts than the older "continuity theory," although a more recent view "rejects the neurone as the physio-

logical unit and considers the fibrillary substance or the neuropile as the medium of nervous activity."[6] (For an exhaustive discussion and bibliography the student is referred to Barker's writings.)[7 8] Although it is stated that the fibrillary substance is present in the gray matter, the nerve cells, and in the fibers from the nerve cells, and that in the more highly developed animals the nerve cells are less numerous in proportion to the fibrillary substance (the ganglion cells being simply nutritional centers), for our purpose, a study of the osteopathic lesion, whatever data we are able to furnish will be patent irrespective of theories.

The *cell body* of a central neurone is variable in shape and size according to location and function. Its projecting processes present much of interest. The *dendrites* resemble the cell body in structure. In some of the neurones they are numerous. These vary in length and size, and their surface is rough and covered with granules called gemmules. Through the dendrite fine filaments pass into the cell body and on into other dendrites and into the axone.

The *axone* is a single branch arising from the cell body, although occasionally originating as far back as a dendrite. Few of the axones are long, as from the surface of the brain to the lower cord. The axone is straight, does not vary in size, and has a smooth covering which is very different from the protoplasmic processes. Along its course it gives off at right angles collateral filaments. It finally ends in a small tuft. On leaving the gray matter the axone becomes medullated to very near its terminus. Some axones split into two branches on nearing their terminus, with separate tufts for each branch.

The *sensory neurone,* as has been stated, develops in the posterior spinal ganglion. It is originally bipolar. At first the two branches are together for a short distance, when later it sends out an axone which divides into two branches. One of these branches extends peripherally and ends in the tactile corpuscles. The other branch passes inward through the posterior nerve root into the cord or brain axis. Within the cord this branch divides, one part passing downward and the other upward in the posterior columns. These branches give off at right angles fine collateral filaments which terminate in tassels within the gray matter of the posterior horn.

The nutrition of the neurone will be considered shortly, but it may be well to state here that the nutrition of both dendrites and axones are dependent upon the cell body.

It will be recalled that a nerve fiber is first composed of an axone or axis cylinder. Then surrounding this is the myelin sheath. The myelin sheath is a series of short tubes placed end to end. The node of Ranvier being a constriction at the point of joining of two tubes. If the sheath is broken the myelin, a fatty, semi-fluid substance, will run out. All nerve fibers (only the medullated) do not contain the myelin sheath. Most of the sympathetics contain no sheath. The sheath begins a short distance below the cell and terminates at the bifurcation of the axone fibrils.

Surrounding the myelin sheath is the sheath of Schwann. At first this connective tissue sheath is segmented, the constrictions being at the node of Ranvier. But in the adult it is continuous.

A bundle of nerves are the axones of the neurones. The connective tissue holding a bundle of fibers together is called the endoneurium, and

connective tissue surrounding the entire bundle is the perineurium. Then the connective tissue binding several bundles together is the epineurium.

THE PHYSIOLOGY AND PATHOLOGY OF THE NEURONE.

From this brief resume of the anatomy of the neurone we will pass to some very interesting features of the physiology of the neurone. There is much in medical literature, especially in experimental neurology and in pathology of the nerves, that has a direct bearing upon the theorem of the osteopathic lesion.

We will pass over the usual elemental physiological teachings of nerve conduction, its nature and direction of the efferent and afferent impulses in their relation to various centers and ganglia, and the several functions of the nerve fibers and terminations.

The first point of particular interest is the nutritional supply. "The blood vessels reach the nervous structures by means of the pia mater. In the spinal cord arteries coming from the vertebral, intercostal and other arteries, and traveling along the nerve roots joins the pia mater, and then through the fissures and septa reach all parts of the cord; but the capillary network is much denser and therefore the blood supply much greater in the gray than in the white matter. The veins, also gathered up along the septa and fissures into the pia mater, those coming from the gray matter forming before they reach the external pia mater a conspicuous longitudinal vein on each side of the posterior gray commissure, pass from the pia mater to the large venous sinuses of the dura mater and so to adjoining veins."[9] This is the blood supply to the spinal cord and ganglia, in its gross form. Histologically in the nerve fiber "capillary vessels with free anastomoses run within the nerve, their walls lying adjacent to the individual fibers and thus affording a perfect nutrition."[10] It is stated that lymph spaces are within the nerve sheath but not among the fibers. Osmosis probably takes place at the nodes of Ranvier, as the myelin sheath interferes at other places, so that the axis cylinder is nourished from the surrounding circulatory fluids. (Also note next paragraph.)

A recent authority[2] states that "a neurone is directly connected with the circulation (via neuroglia-fibril) by one or more of its dendrites, which serve as channels for blood plasma." In fact "all the component parts of a neurone—cell body, dendrites, axone and axis cylinder—serve as channels for blood-plasma." * * * * "A neurone receives its nutrition and its oxidizing substance directly from the general circulation, and the blood which enters by way of the apical dendrites is distributed to the free dendrites and to the cell body." From the axone the blood "finds its way into a lymph-space connected with a vein, thence to the general circulation." Thus in reality a part of the circulatory system is that of the entire cerebrospinal system. Consequently "a quiet and steady flow of blood into the cellular structures, sustained by the tonic contraction of the arteries, and a stream of nervous impulses to the tissues coinciding in rhythm, perhaps, with that sent to the vessels, suffice to insure nutrition and to hold the structures thus supplied ready for active work."

Dr. Sajous tells us that nervous energy is liberated when the oxygen of the plasma and the phosphorus of the myelin are brought into contact. This

demands, of course, an uninterrupted flow of blood plasma through the channels of the neurone as well as undisturbed ingress and egress of the nutritional fluids from the artery to dendrites and from axone to veins *via* lymph spaces. In other words perfect nerve activity is absolutely dependent upon anatomical integrity. Mechanical pressure upon a nerve disturbs its function immediately, and when the compression is released the nerve regains "its condition of moisture, which, during the squeeze has undoubtedly been diminished."[11] "If there is an imperfect blood supply or a deleterious substance of any kind in the blood, then the process of building up fails to take place, and the neurone can not resume its function."[10]

All neurologists are agreed that "nervous tissue is dependent for its integrity upon two things, blood supply and trophic influences. The nerve cell is solely dependent on a proper supply of blood, and dies when this is withdrawn. But the nerve fiber is more dependent on the trophic influence of the cell of which it is a prolongation. It dies when cut off from the cell. *but it can get along for a time with but little direct blood supply. On the other hand. if the nerve fiber is injured it reacts on the cell, leading to a partial but curable degeneration of the cell body.*"[12*]

Viewing that "a neurone is an autonomus organ as a source of nervous energy, and is supplied with blood-plasma through non-medullated neuroglia fibrils, which are continuous with the external covering of its apical dendrites," and that "Apathy's neuro-fibrils and the various net-works thought to be composed of nerve-fibers by Gerlach, Golgi, B. Haller and others represent one and the same system of neuroglia-fibrils, some of which contain myelin and blood-plasma and may, therefore, be considered as nerves, while others only contain plasma and are, therefore, blood-channels," it is concluded by Sajous that "each neuroglia-fibril is affixed to the wall of the vessel either directly or through the intermediary of a neuroglia cell, and therefrom extends to the main, or apical, dendrite or dendrites, of some neurone." Thus "a neurone receives its nutrition and its oxidizing substance directly from the general circulation, and the blood which enters by way of the apical dendrites is distributed to the free dendrites and to the cell-body."

The principal thoughts to be drawn by the osteopathist from these mere conclusions, which represent much experiment and study, are, first, nerve intactness is directly and absolutely dependent upon a normal circulation; second, neurones are intimately a part and extension of vascular channels; and third, it is self evident that any blockage, mechanical or otherwise, to either blood vessels proper or to neurones will vitally affect those tissues. nerves, that govern and control the life processes of the body.

One interesting point might be added here before we pass on to pathological evidence of considerable moment to an explanation of the osteopathic lesion. That is, it is claimed "the gemmules as peripheral extensions of the dendritic walls having for their purpose to increase, when erect, the area of myelin exposed to the action of the oxidizing substance of the plasma, and thus to render the dendrite functionally active: i. e., able to transmit or receive nervous impulses." Thus the gemmules project during functional activity, while during inactivity they recede, as, for example, during sleep

* Italics Ours.

or anesthesia. As for the axone part of the connection with that of the dendrite or another neurone it is said, though in apparent contact, they may be separated infinitesimally, and that through "vibration, which means rapidly alternating juxtaposition and separation of the bulbous end organs" is functional activity maintained. Consequently all the systemic axonal and dendritic end-organs are in a state of constant vibration, and naturally this is regulated by requirements and functions of tissue and organs. Again we must emphasize that uninterrupted blood flow is necessary to maintain function and life, which is the physiological basis of osteopathic science. Furthermore, *a priori* reasoning would indicate that the anatomic and physiologic mechanics would imply a mechano-etiology and a mechano-therapeutics. Let us see what pathological research has to offer.

The *pathology* of the neurone is an extensive field. The field is comparatively little developed; at best only fragmentary data can be given. Naturally, neuropathic investigation and experimentation is fraught with many difficulties.

In our pathological references we will mention such data as has a more or less direct bearing upon the osteopathic lesion theory. This necessarily includes a certain amount of general neuropathologic knowledge and especially the effects of traumatism on nervous tissue.

We know that nerve tissue is composed of nerve cells, nerve fibers, neuroglia, connective tissue, blood vessels and lymphatics; and diseases of the nervous system, functional or organic, are effects, directly or indirectly, of one or more of these tissues. The part that concerns us most are those primary or secondary changes of the neurone superinduced by pressure disturbances.

Dana places most weight upon inflammation and degeneration as causes of diseases of the nervous system. He argues, under inflammatory changes, that "inflammation, teleogically, is the reaction of the organism to an irritant. Wherever there is inflammation, there is irritation." Inflammation concerns, primarily, blood vessels, lymphatics and connective tissue. He says without microbe or tissue irritant there can be no inflammation. One probable exception is made, and that is with chemical substances as alcohol, lead and arsenic. Osteopathically this may be granted as far as it goes. No doubt microbic action is an important, but not necessarily a causative, factor in inflammation processes. There must be first the proper field leading up to this pathological change. Osteopathically and surgically this field is recognized—disturbed nutrition.

Degeneration, Dana says, means a gradual death of the parenchyma of the organ. This may be either acute or chronic, primary or secondary. Acute degeneration is due to cutting off of the vascular supply, direct injury, or to necrotic and inflammatory poisons. In chronic degeneration there is proliferation of connective tissue and sclerosis. When the process is due to inherent defect in nutrition or to some poison acting directly on cell or fiber it is termed primary degeneration. "A secondary degeneration is one that is due to a cutting off of nerve fiber from its trophic center, or to an injury or shutting off of its vascular supply." Neurologists freely admit that much is still unknown of the etiology and pathology of neuropathic disorders; and it is surprising how much they refer to injuries, cutting off

of blood supply, etc., without continuing this line of thought. It seems evident that if they would only look at pathology from the angle of osteopathy much could be added to the store of neurological knowledge.

At the basis of organic changes there is disintegration and destruction of the cell, dendrites, and axones, or the axone alone may be involved in certain cases. This means chemically changed tissues. In interstitial inflammation mechanical compression upon the neurones may occur, due to an increase in the supporting substance (connective tissue and neuroglia), causing a serious degeneration in the neurone.—(Starr.) "Mechanic and inflammatory oedema causes degeneration and consecutive softening of the cord."[13] "Forcible interference of a nerve tract has the same effect as degeneration of a cord area."[14]

"The nutritive center of a neurone is in the perikaryon. The trophic influence emanates from the nucleus. If any part of a neurone be severed from its nucleus, the separated part dies. In case it is a medullated axone, which suffers solution of continuity, not only does the whole axone, distal from the lesion, undergo disintegration but the myelin sheath degenerates in the same area and the nucleated sheath of Schwann or neurilemma undergoes important modifications. These phenomena taken in their totality are usually designated as secondary or Wallerian degeneration."[8]

"If a motor nerve is cut, all the fibers in the peripheral end degenerate completely as far as the muscles which they supply, the central end either remaining entirely intact or perhaps, as a result of the trauma, degenerating as far as the first node of Ranvier. If a sensory be cut distalward from the spinal ganglia, all the sensory fibers of that nerve degenerate to the very periphery, though the portion of the nerve still in connection with the ganglion, as well as the central intramedullary continuation of the nerve, remain undegenerated. On the other hand, if a dorsal root of a spinal nerve is severed between the ganglion and the spinal cord, the portion of the nerve attached to the ganglion does not undergo degeneration, but that connected with the cord degenerates typically, not only in the portion outside the cord, but also throughout its whole intramedullary extent. This is proof which has been brought for the view that the cell bodies in the spinal ganglia are the trophic centers for the peripheral sensory neurones. Following upon Waller's investigations came the observations of Turck, which demonstrated that the same law holds within the confines of the central nervous system —for example, for the pyramidal tract. Since Turck's studies, a host of observations have established the general validity of the law for all groups of neurones. *When an axone degenerates the retrogressive process involves not only the main axone, but also its terminals, together with the collaterals belonging to it, with their terminals.*"[8*] This law is of the utmost value in studying the effects, especially remote effects, of a lesion, in the osteopathic sense, of the nervous system. This law, coupled with the conclusions of Dr. Sajous relative to the intimate association of the vascular system with the cerebro-spinal system, makes an interesting basis for study of the pathology of pressure and traumatic lesions.

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* Italics Ours.

Pathological information is not lacking that mechanical pressure on nervous tissues causes degenerative influences. Indeed, there is considerable reference in various pathological anatomies and histologies that traumatic influences are frequent sources of disorders. But, of course, the wide applicability of this factor, in the osteopathic sense, has not as yet been recognized. Herein lies the tremendous field of osteopathic pathology.

"Among the most common causes of degeneration of the cord," says Ziegler, [16] "are traumatic injuries and gradual compression." He refers here to fractures and dislocations of the spinal column, contusion and concussion of the spine, and of cuts, stabs and wounds, as the traumatic causes of textural change and degeneration of the cord. He also speaks of the importance of compression of the cord from tubercular disease. Here compression may be caused by tuberculous proliferation in the epidural space, by tumors, and by caries. The compression may come slowly or rapidly. There is no sharp line between compression and crushing. In slow compression the degeneration is chiefly due to interference with the circulation of the blood and lymph.

The above statements by a pathologist with a world-wide reputation such as Ziegler enjoys is of the utmost value to us. That an important and extensive part of degeneration of the spinal cord may be caused by compression and crushing and by mere contusion and concussion, is of significant importance. If traumatic and pressure pathology play an important part in spinal cord degeneration the same influence certainly would be applicable elsewhere. Remaining tissues would not be exempt from this source of disorder. After all, the integrity of a tissue is dependent upon blood and lymph supply. Anything that affects these vascular systems, whether primarily or secondarily, directly or remotely, is at the foundation of pathology. This is the solid ground upon which the osteopathic conception of disease rests. It appears self-evident, at least theoretically, that to apply this mechano-anatomical pressure principle universally is logical.

Under degeneration and inflammation of nerves Ziegler says that "severe crushing and stretching have an effect very similar to that of section, and so also has continued compression, such as is occasionally caused by tumors, by the contraction of scar tissue, by inflamed lymph-glands, and the like. The interruption of conductivity does not, however, at once involve all the nerve-bundles, but rather tends to take place successively in the several strands." Here we have authoritative evidence that crushing, stretching and compression forces are causes of nerve degeneration and inflammations. This is essentially osteopathic in character. What is the difference in effect whether a nerve or blood vessel is obstructed by a tumor, scar tissue or a broken clavicle, a dislocated hip or a twisted rib? As to the potency of a lesion, is slow and partial compression of nerve strands from a lateral spinal curvature any different from tubercular cell proliferation? Does it stand to reason that the effects of a wrench or twist between two vertebrae, or the twist of a rib, are any less real than pressure on cervical sympathetic fibers to the eye from a fractured collar bone, or interference with ovarian circulation from a displaced uterus?

When an Ericksen,[16] Page,[17] Clevenger,[18] Moullin,[19] Hilton[20] and Hamilton,[21] surgeons of most extensive practices, readily go on record that functional and organic nervous diseases may arise from contusion and concussion of the spine and from wrenches of the spinal column and rib tissues, it is not a tremendous gap nor an irrelevant step from their conclusions t the osteopathic theory. These writers and authorities, and especially Ericksen and Clevenger, in their respective treatises on spinal concussion, freely make note that they are greatly hampered from two causes; foremost, there have been practically few postmortems of the central and peripheral nervous systems to locate macroscopic or miscroscopic changes that one is warranted to believe, from symptomatic data, to exist. The reasons for this are that sufferers from these accidents are rarely examined post-mortemly, and the usual dead-house autopsy does not include a careful examination of the nervous system. Then, secondly, nothing is known of the dividing line between functional and organic nervous disease; still this is of secondary importance in the way that a solution is dependent upon extensive autopsy and microscopical work.

This field is approached time and time again by the medical profession. Even as far back as the writing of Abercrombie (1829) and Sir Astley Cooper, reliable observations of the effect of traumatism is noted. But as usual, it is their wrong conception of etiology with a consequent employment of wrong methods that accounts for the lack of development of this important phase of medicine. Naturally, experimental physiology, from the osteopathic concept, must be the means for a solution of this problem.

It is hardly necessary to recall the effects of hyperæmia, thrombus, or embolus upon nerve tissues; or of exhaustion, or of toxines. These pathological findings are vitally a part of the osteopathic pathology, but still they are somewhat beside the point we are especially discussing, viz., direct mechanical pressure effects upon nervous tissue. However, the pathology of a thrombus or embolus, or hæmorrhage, œdema, and inflammation, hinges to a large extent upon mechanical factors, but we must, in this limited summary, remain close to a discussion of the osteopathic lesion in a narrow sense. Providing a sufficient osteopathic lesion exists it requires no greater stretch of the imagination to appreciate an ascending degeneration of the motor tract from it than often follows a hæmorrhagic lesion. Still, often many cases of paralysis are secondary to heart, kidneys, etc., diseases of which a comparatively slight lesion was the inception. Here is where osteopathic lesions are of great moment—at the very inception of functional and organic changes, and which diseases so often run into secondary and remote disorders, in which the physician can only offer slight prophylaxis. Our query at this point deals more with the question whether osteopathic lesions are a tangible reality and whether slight mechanical disturbances have a definite pathology.

The Brieger and Ehrlich experiments of temporarily applying a ligature to the abdominal aorta, which is followed by acute necrosis of the cells of the lumbar cord, are of interest. These experiments, employing the Marchi staining, show that the degeneration process not only affects the cell bodies, but the entire neurone.

"Degenerations of a secondary character may occur in those systems of neurones which are more or less dependent upon the peripheral sensory neurone system for their impulses."[22]* This, also, shows how far-reaching a degenerative process and its effects may be. When we remember that some axones are a metre or more in length, and then besides other more or less dependent (dependent for their impulses) neurones may be involved, a single lesion can be far-reaching. "Thus the cells of Clarke's Column may be affected, with resulting degeneration of their axones which make up the direct cerebellar tract. This degeneration extends through the restiform body to the termination of the tract in the cerebellum. The cells of the gray matter whose axones form Gowers' tract may be degenerated, with consequent degeneration of the fibers of this tract. In the medulla the cells of the nucleus gracilis and nucleus cuneatus may be affected, thus determining an ascending degeneration along the tracts followed by their axones." (Pathology of tabes dorsalis.) This may be explained in part by "dependent impulses," but probably, also, that the neurone, although in a morphological sense is a complete unit, still, physiologically, the neurone is a unit in a lesser degree. Apathy, Held, Bethe and Nisse, authoritative neurologists, claim that "in many cases axones pass directly into the protoplasm of another neurone and that the neurofibrils are sometimes continuous throughout a series of neurones."[22]

Ericksen cites a case of injury (reported by Dr. Lockhart Clarke) that resulted in locomotor ataxia. The post-mortem findings showed typical lesions of this disease. The posterior horns and all the posterior columns were exclusively the seat of the disease. Clevenger and Hamilton believe that locomotor ataxia may result from injury. Most syphilologists claim at least 98 per cent. of the disease is caused from syphilis. Possibly injuries of the spinal column excite latent syphilitic condition that develop locomotor ataxia. But this does not seem probable in all cases of the disease reported due to injury. Locomotor ataxia is a disease of fibers of extra-spinal origin in their intra-spinal course, and osteopathic lesions could have a very decided causative effect. When such authors as Ericksen, Clev enger, Hamilton and Landois, lay stress upon the molecular effects of spinal concussion, and Clevenger and Fox[23] upon injuries (from physical violence) to the sympathetics in front of the spinal column as causes of nervous diseases, the osteopathic concept must appear even more logical in comparison.

Certainly "the arterial blood supply of cord and the return venous and lymph circulation have peculiarities that predispose"[24] to disease; and, also, the fact that the cord is made up of "extra-spinal constituents (posterior columns) and of cerebral constituents (motor tracts) as well as special spinal substance (ganglion cells)" the susceptibility of the cord to many diseases, directly or indirectly, is greatly increased. Then "the blood vessels of the spinal cord are seemingly more susceptible to the injurious action of certain poisons taken into the system from without or generated within the body, than other vessels are." Especially is this shown in such diseases as gout,

* Italics Ours.

rheumatism, and syphilis. But is it not possible that the frequent and innumerable osteopathic spinal column and rib lesions that we find is one great reason for this peculiar susceptibility of the spinal cord blood vessels to disease? By maintaining the anatomical integrity of the spinal column, and eliminating drug poisons, would not important etiologic factors be removed? Through all this mass of data (anatomical, physiological, pathological, clinical, etc.) the question continually arises, what and where is the immediate effect of the osteopathic lesion? Is it without or within (or either) the spinal cord? Molecular and physical effects may result with the cord or sympathetic ganglia, involving function and possibly causing organic changes. But we have every clinical experience to believe many lesions are structural and resting within the extra-spinal tissues, although anatomical, physiological and even pathological data points to secondary effects of the cord and sympathetic processes. And still it is but logical to reason that these spinal column structural changes (osteopathic lesions) readily involve blood and lymph channels and neurone processes, both directly and indirectly, by pressure. Outside of osteopathic data reliable information is found in medical literature of these occurrences. Even when "deep massage to the muscles of the back promotes the flow of venous blood through the spinal vessels and their anastomotic branches," and, according to Starr, is the best means of relieving the congestion which is supposed to exist in the early stage of locomotor ataxia, what should we reasonably expect on carrying out the osteopathic theory to universal applicability? It really comes back to the point of a development of our pathology by experimental physiological means, and not altogether a defense of our principle. A principle must have defensible ground; we have the grounds tentatively supported by clinical data; it now remains to exploit our claims on other lines.

THE OSTEOPATHIC LESION.

We have taken Dr. Hulett's definition, that any structural perversion which by pressure produces or maintains functional disorder, as an acceptable description of the osteopathic lesion. This definition is inclusive of a wide range of etiological factors, but in our presentation here it is evident we are obliged to narrow our subject to a discussion of a typical osteopathic lesion in the sense that what is applicable as a type will to a greater extent include, at least by analogy, the essential features of all osteopathic lesions. In our experimentations, as will be seen, we have been investigating the phenomena resulting from rib and vertebral sub-dislocations of the splanchnic nerve area. The reasons for this are obvious; first, the mid-dorsal section presents a region for typical spinal cord and sympathetic segments and for ideal osteopathic lesions. Then besides, results of investigation are more positive, as an analysis of the stomach contents furnishes additional data. Also, the interlacing of the spinal and sympathetic fibers are not nearly so frequent in the dorsal area as in the cervical, lumbar and sacral areas; in a word, the pre-vertebral dorsal system is comparatively simple.

Evidence bearing specifically upon the osteopathic lesion should include clinical evidence, physiological and pathological evidence, and experimental evidence. Owing to lack of time and the fact that it is a matter of common experience we will waive the clinical evidence.

In medical literature there is much fragmentary data pertaining directly or indirectly to the osteopathic concept of diseases. Clevenger has gathered much material bearing upon his idea of the pathology of spinal concussion. In his writings he has sought to establish a mechano-pathological interference with the sympathetics with consequent nutrient reflexes as the basis of spinal concussion pathology in distinction, for example, of the molecular-structural-change hypothesis of Ericksen. Clevenger, however, applies this line of thought to the phenomena following railway and other serious injuries only. Still the material presented bears directly upon osteopathic pathology.

The older writers, as Olliver and Abercrombie, considered the symptoms of spinal concussion due to inflammatory cord conditions. Ericksen said the primary effects of these concussions or commotions of the spinal cord are probably due to molecular changes in its structure. The secondary are mostly of an inflammatory character, or are dependent on retrogressive organic changes, such as softening, etc., consequent on interference with its nutrition. Stilling regarded spinal irritation the same as hyprœmia of the cord; Hammond as to anemia. Erb considered spinal irritation as located within the structures of the spinal cord; he does not believe "that the meninges are first to be affected, and the nerve-roots and the cord suffer secondarily."[25]

When emphasis[26] [16] was placed upon the succulency and ready compressibility of the connective tissue plexuses that support the ganglia of the sympathetic, and due appreciation given that the sympathetic is, morphologically, simply a spinal nerve, whose three elements are the posterior root, the anterior root and the sympathetic root, a somewhat clearer understanding was had of the pathology of Ericksen's disease. There is probably a swinging elasticity, of a quarter of an inch or more in some parts, of the connective tissues, plexuses and contiguous tissues that inclose and support the ganglia. Then regarding the sympathetic as essentially a spinal nerve is very important from a pathological point of view.

These thoughts in a sense approach the osteopathic concept. At least the mechanical idea of structural tissue relationship and of possible mechanical disturbance of this relationship from injuries, jars, etc., is set forth. The point of lesion, however, results from shaking or jarring, or stretching of the tissues *in toto;* and the clear-cut mechanical mal-adjustment or mal-alignment is not suggested.

For example, it is said that the thoracic and sacral pre-vertebral rami are in the greatest danger from jars, as they are short and in close connection to the body of the vertebrae. The neck and psoas muscles afford extra protection to the sympathetics in their respective regions. The pelvic rami

communicantes with spinal nerve roots are short; derangements may easily occur here.

Another writer, Hilton, says it is possible "the little filaments of the sensitive and motor nerves, which are delicately attached to the spinal marrow, may, for a moment, be put in a state of extreme tension, because, as they pass through the inter-vertebral foramina, they are fixed by the dura mater." He, also, says that it is impossible that the symptoms following "could be the result of anything but some structural disturbance: and they are, to my mind, the evidence of decided injury to the nerves or marrow, although what the injury may be is not ascertained." Clevenger has commented on "these views of Hilton's as being capable of extension to wrenches, etc., of the vertebrae, not only disturbing the precarious circulation of the cord, but by strains inducing more or less irritation of the nerve-roots and meninges, and, which seems to have been wholly lost sight of by all writers, lesions of the soft and poorly protected spinal sympathetic communicating fibers." Oppenheim says in referring to this subject "'that concussion and jolts of the body can unduly stretch and tear ligaments, muscles and other structures." Other prominent writers that have voiced the importance of spinal wrenches are Page,[17] Moullin,[19] Golebiewski,[27] and Hamilton, but space forbids our quoting them.

The gist of Clevenger's argument is that the pathological lesion in spinal concussion will be found in the pre-vertebral sympathetics. There can be no doubt that the osteopathic mechano-pathology is a fact. The thousands of experiences on the part of our fraternity, of course, is ample evidence, but in addition various medical writers, in a way, substantiate our claims. Whether or not there is a wide pathology is the point of interest to us. That there are definite macroscopic and microscopic changes can not be doubted. Thorburn [45] tells us it is perfectly obvious that certain vascular changes, caused by injuries to nervous structure, produce important effects on internal organs. Likewise Bailey[30] emphasizes the importance of injury to nervous tissue in causing various disorders. These works may be studied to great advantage as well as other recent literature and older writings like Mitchell's.[46] (We have placed considerable emphasis on some of the older writings owing to their historical importance, although a work like Bailey's is much more comprehensive.) All of this study, however, leaves one almost at the point he started from. It is very evident we must develop our pathology strictly along our own lines. The osteopathic lesion (primarily) can not be other than a traumatic factor; and one from a mechanical mal-adjustment viewpoint. The many writers on accident and injury to the nervous tissue constantly emphasize the effect of direct blows to and fractures of hard tissues and the like on the nervous structures. We would especially recommend the works of Bailey[30] and Thorburn[45] as two excellent books for osteopaths. Both writers approach the osteopathic concept, after a manner, in several phases and thus their contributions to traumatic pathology is invaluable. In this article we can only partly introduce a few of the many interesting points. After stating the results of our osteopathic physiological experi-

ments, we will summarize some of the physiological and pathological data pertaining to the pathology of spinal concussion, as it is closely allied to the osteopathic.

A FEW EXPERIMENTS.

The more one studies the subject of osteopathic lesion the more evident becomes the fact that to get the true scientific insight of its pathology experimental physiology should be employed. After all is said we are obliged to come back to the point that research work is the cornerstone of science. Osteopathic science demands first hand investigation; in fact, this is the *sine qua non* in order to place our work beyond any question of empiricism. A fair percentage of all medical practice is empirical; that is, based on experience and observation; and the simple reason why medical practice is continually presenting a kaleidoscopic shifting is because various scientific methods of investigation are constantly revealing the futility of many phases of practice.

To make a start in what we believe is the correct direction we have attempted a series of experiments on dogs during the past year. Typical vertebral, rib and muscular osteopathic lesions have been produced on these animals, followed by a study of the effects of the lesions on organic function and of the immediate or direct effect of the osteopathic lesion to nervous tissue. Dogs were chosen for these experiments, as their vertebral, rib, nervous and organic anatomy presents many structural and physiological characteristics similar to the human. We are not intimating that our few experiments were exhaustive or approached perfection in any particular; indeed, exhaustive researches will require many years of work on the part of the profession.* But we believe what data we are able to present is absolutely reliable and is of such fundamental value as to be an inspiration for a continuance of this line of work. Although it is of a very elementary character and the time, one year, is a short period, some preliminary work as to technique and various methods have been sifted. To the best of our knowledge this is the first time experiments of this particular nature have been attempted. Every physiologist and pathologist knows full well how exceedingly difficult such experiments are, but there can be no question if we hope to place osteopathy on a thoroughly scientific foundation we will be obliged to exploit osteopathy on these and similar lines.

The dogs chosen for the experiments were healthy ones. A few hours previous to the operation in which we produced the osteopathic lesion the dog was anæsthetized, the stomach tube introduced and the contents of the stomach removed for analysis and at stated intervals after production of the lesion the stomach contents were analyzed. Regulation as to food and drink was secured throughout the period of experiments.

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* We are well aware of some of the imperfections of this address, but we feel that the presentation as it is, the address as a whole will act as an impetus in creating an interest in others for osteopathic pathological work.

Dog No. 1. Under anæsthetic the dog's lower and middle dorsal region was sprung forward with fairly moderate force.

Six weeks later dissection revealed an anterior "break" between the tenth and eleventh dorsal vertebrae. Also, the fourth and fifth ribs on right side were sprung upward at the vertebral ends. Muscles and ligaments over and between injured vertebrae and ribs very tense and rigid.

Macroscopic hæmorrhagic spots from the size of a pin point to head of a pin were found in the sympathetics opposite the "break" and in the corresponding rami on both sides. Congestion of spinal nerves between the tenth and eleventh ribs.

Stricture in the lower third of the jejunum.

The miscroscope revealed pathological congestion of the above affected nerves, that is, an intracellular congestion.

See Cut I.

Dog No. 2. Three weeks after production of the lesions dissection showed the eighth rib on the right side and the seventh rib on the left displaced upward at the vertebral ends.

The muscles, superficial and deep, contiguous to the lesions, were rigid.

There was marked inflammation of the corresponding sympathetics and rami (macroscopically and miscroscopically).

Enlargement of the spleen to twice normal size.

See Cut II.

Dog. No. 3. Two weeks after operation dissection showed the fourth, fifth and sixth ribs on the right side dislocated upward at the vertebral ends.

The usual muscular tension and rigidity of the spinal ligaments in the area affected.

Marked inflammation and hæmorrhage of the sympathetic chain, the rami, posterior spinal nerves, the intercostal, the posterior and anterior nerve roots, the meninges of the cord for a diameter of a quarter of an inch surrounding the exit of the fifth spinal nerve on the right side, and along the corresponding anterior commissure. The pathological condition here was exceptionally marked. The dog was sick and inactive for a week following the first forty-eight hours after the operation.

Enlargement of spleen to over twice the normal size.

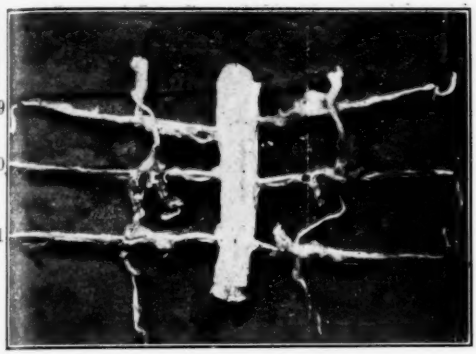
See Cut III.

Dog. No. 4. Sixteen days after operation dissection exhibited upward displacement of the vertebral ends of the fourth, fifth and sixth ribs on the right side.

Hæmorrhagic spots and congestion were found along the course of the fifth intercostal nerve, the ramus and the posterior ganglion.Slight inflammation of meninges at exit of the spinal nerve and of the anterior commissure.

See Cut IV.

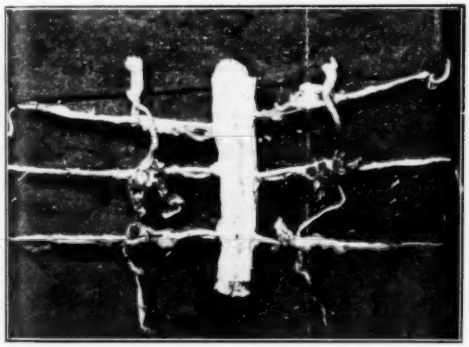
Dog. No. 5. One week after operation showed lateral vertebral twist between third and fourth dorsals. Vertebral end of right third and fourth ribs sub-dislocated upward. The usual rigidity and tenseness of spinal column tissues. This dog lost much flesh and was very sick from twenty-four hours after operation to time of dissection.



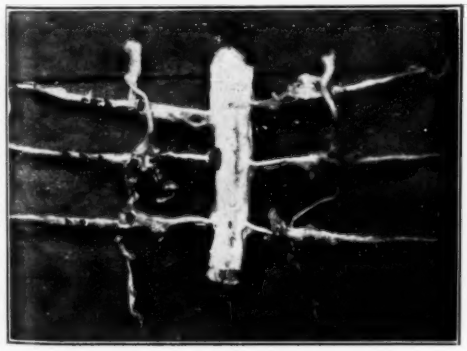
CUT NO. I.

This cut, as well as the succeeding five, show clearly the position and relation of the lesions (pathalogical.) By referring to the paper the mechano-anatomical or osteopathic lesions may be found. The numbers to the left refer to the dorsal segments. It should be noted and remembered that we produced no complete dislocation, no fractures, nor did we lacerate any of the tissures whatever—simply an ordinary osteopathic lesion.

The six spinal cord dissections are photographs of the same dissection, although careful dissections *in situ* were made in each case. We were assisted in the experimental work by Dr. Frank C. Farmer, and careful notes were taken, so that we feel what little there is to offer is faithfully reproduced.



CUT NO. II.



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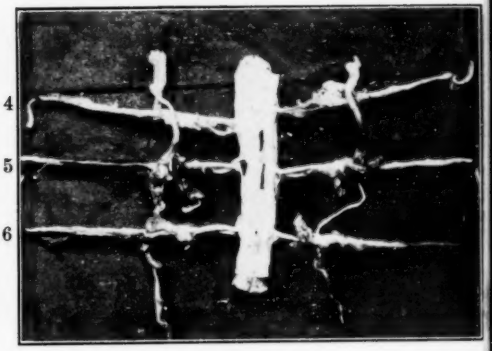

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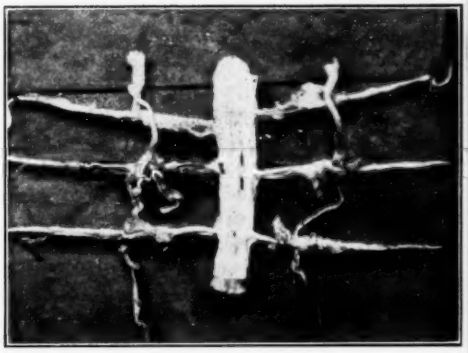


CUT NO. V.

CUT NO. VI.

Stomach of dog number five, showing areas of ecchymoses, clearly defined to the naked eye.

Cut No. VII.

MICROPHOTOGRAPH FROM WALLS OF STOMACH OF DOG NUMBER FIVE.

A passive congestion as shown by the extreme dilatation of the vein, the ecchymosis, and the actual hæmorrhage outside of the vein. This depicts lack of tonicity and early degeneration of the vessels.

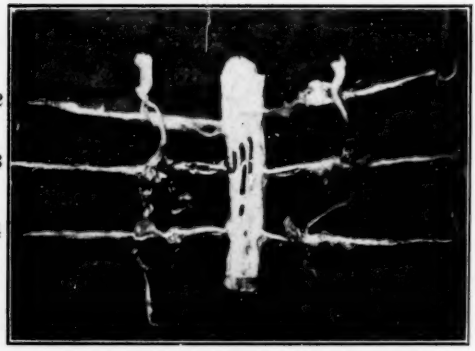
Dog number six exhibited sections similar to the above.

Cut No. VIII.

MICROPHOTOGRAPH FROM STOMACH WALLS OF DOG NUMBER FIVE.

An early parenchymatous degeneration as shown by the feeble stain taken up and in places by its complete absence. In a few places there is partial atrophy; this is limited to the glands themselves and is specially shown at the free ends. Under high power, cloudy swelling and degeneration of the base and nuclei can be seen.

Dog number six exhibited sections similar to the above.



Cut No. IX.

Cut No. X.

Stomach of dog number six, showing area of ecchymosis, clearly defined to the naked eye

Hæmorrhages and inflammation of the sympathetic, rami, intercostal third nerve on right side, and slight ecchymotic spots, size of pin head, along anterior and posterior nerve roots and in meninges at exit of roots. Also along the corresponding anterior commissure.

Stomach walls stretched (thinned and dilated). An area, over a square inch, near the cardiac end, and another area along the greater curvature were found noticeably congested. Microscope revealed marked intracellular congestion and ecchymosis of these patches; also beginning atrophy of the glands.

See Cuts V, VI, VII, VIII.

Dog. No. 6. Nineteen days after production of lesion dissection revealed vertebral twists between second and third dorsals and between fourth and fifth dorsals.

There was slight ecchymosis and congestion along corresponding rami, posterior ganglion, anterior and posterior spinal nerve roots, and the meninges at exit of nerve roots and along the anterior commissure.

Two-thirds of the stomach area, and especially at the œsophageal end, showed considerable congestion. The line of demarcation between congested and normal stomach tissue was marked. The stomach contained considerable regurgitated bile. The dog was ill, loss of appetite, excessive thirst and loss of flesh.

The microscope showed a similar pathological condition of the stomach as in number five. Microscopically the meninges of the cord were slightly congested.

The spleen was slightly enlarged.

See Cuts IX, X.

Careful chemical analyses of the stomach contents of the dogs before and after production of the lesions showed a marked difference in the chemical reaction. The following deductions as to the stomach may be drawn from the analyses and experiments:

1. The muscular action of the stomach is lessened.
2. The secretions of the stomach are decreased.
3. The physiological and mechanical functions of the stomach are retarded.

The microscope reveals intra-cellular congestion and ecchymoses of the stomach tissues, and beginning degeneration of the glandular cells.

Notes: (a). Two anatomical features relative to our experiments are worthy of special note; first, the sympathetic chain passes directly against and anterior to the head of the ribs (also, see Chauveau[28]), and, second, the spinal nerve makes its exit directly against and superior to the head of the rib. Owing to this second anatomical feature we purposely displaced upward the vertebral end of the ribs.

(b) The lesions we produced were typical and moderate osteopathic lesions; not severe dislocations nor fractures.

(c) With the exception of the second, fifth and sixth dogs the animals got over noticeable stiffness and soreness in a day or two, although the lesions were sensitive to touch similar to the wincing exhibited by the human.

(d) The macroscopic contrast between the injured nervous tissue and the

pearly white normal nervous tissues was very noticeable. One should be guarded in their examination of some of the ganglia, particularly the posterior ganglion and of some of the cervical ganglia as they be normally reddish in hue.

(e) In all cases where the meninges or cord was involved a slight corresponding ecchymosis of the anterior commissure was noticed.

(f) Future experimental work should take into account the paths of degeneration in the nervous structures. The degeneration that we noted, of any of the structures or organs, was of short duration (early parenchymatous), thus substantiating the potency of the osteopathic lesion and ruling out a possibility of previous chronic disease.

The experiments revealed a similarity in every respect, relative to the pathology of the osteopathic lesion, viz., mal-adjustment of tissues produces primarily pressure phenomena as exhibited by congestion, inflammation, ecchymosis and hæmorrhage of the contiguous nervous structures. Thus the controlling and governing mechanism being involved not only do the injured neurones become disturbed in their functional integrity, but the collaterals with their terminals become also involved. Consequently the pathology of the osteopathic lesion may be far reaching and comprehensive, e. g., injury of the sensory neurone may not only involve the superior and inferior branches within the posterior column, but the collaterals and other neurones dependent upon the sensory neurones, impulses, etc. Much, of course, remains to be established—paths of degeneration, and the various pathological problems to be solved.

All of the physiological, pathological, experimental and clinical data, however, concurs in the theory that a physically disturbed anatomical is productive of functional and organic disorder absolutely independent of and in many instances primary to cell disturbance from auto-intoxication, dietetic lesions, hygienic abuses and the like.

Many writers, as Bailey,[29 30] Mickle,[31] Dana,[32] Da Costa,[33] Knapp,[34] Outten,[35] Strumpell, have striven to show in their writings bearing upon traumatic effects of the nervous system that traumatic hysteria or traumatic neurasthenia is not necessarily a clinical entity, which is probably true, although they are not questioning but there is a certain pathology here. But what interests us here is only a few are willing to admit that various injuries to the spinal tissues may give rise to an important pathology. Clark[36] says "slight anatomical lesions, minute ecchymoses, blood extravasations or bruisings, as part of the 'commotion' of the brain and cord from the accident" may give rise to functional nervous disorders, although he seems to think it of more theoretical interest than of practical importance. He does not place as much emphasis upon the importance of traumatic injuries to the central nervous system as some other writers. Still the discussion of this subject (in a broad sense) is considered, usually, under different etiological headings, viz., traumatic neurasthenia (as above), injuries to the vertebrae, cord, etc. Under injuries to the spinal cord Horsely[37] says pain may arise from pressure on the sensitive dura mater, or the nerve root may be implicated, or the nerve fibers from extra dural and extra spinous injuries. Likewise Gowers[38] tells us in spinal injuries how hæmorrhage may occur into the membranes of the cord itself, and how softening of the cord may occur, the anterior root

fibers degenerate, and the usual ascending and descending degenerations may be found above and below the most damaged parts.

The above paragraph gives an inkling of the wide pathology that may follow traumatism—from traumatic hysteria and neurasthenia to visible injuries of the spinal column. Medical writers are not agreed as to the importance of the subject, but the fact is evident there is no experimental evidence and but little post mortem investigation for them to base an intelligent conclusion upon. It is claimed by Pell, Oppenheim and others[32] that post mortems in traumatic hysteria reveal neither macroscopic nor microscopic changes; this hardly approaches the subject here to any extent, for in osteopathic work, in the narrower sense, we are considering definite mechanical derangements only. Dana[32] does not believe in the practicality of molecular disturbance (spinal concussion) of the brain and cord, still he states that in injuries to the spinal column laceration of vessels or nerves may take place, which may be followed by reactive inflammatory changes, gliosis and syphilitic exudate. It is not the technical definition of spinal concussion (that is, molecular changes, traumatic hysteria, traumatic neurasthenia, transverse myelitis or some other result from the injury) we wish to discuss here, as stated elsewhere, but whether there is a definite pathology of mechano-anatomical injuries. Mickle[31] believes thoroughly that traumatism is a potent etiologic factor in mental disturbances; the cause varying from slight molecular changes in brain and cord to gross lesions of same, and acting either as excitant or predisponent.

To conclude provisionally as to the character of the osteopathic lesion in its relation to the nervous tissue we believe pressure from contiguous tissues produces intra-cellular congestion in transient and mild injuries, although this is soon followed by oedema, inflammation, ecchymoses and hæmorrhages where disorder is at all permanent or severe. Nerve tissue is certainly richly supplied with the blood elements either directly or indirectly through the direct introduction of the capillaries or through osmotic influence. Sajous' theory, as heretofore stated, relative to the direct continuation of the blood flow through the neuroglian fibril and the neurone is a novel one and from noting the logic of his deduction it seems to have merit. Then a neurones' conductivity or integrity being disturbed by congestion or inflammation due to anatomical pressure, as it undoubtedly can be, it is but a step in the pathological chain until dependent and collateral neurones are involved, for Barker informs us the impulses of dependent and collateral neurones are *dependent upon the integrity of higher and correlated neurones.* This opens a new and immense field for pathology.

We have seen how the sympathetic chain passes directly against and anteriorly over the head of the rib so that lesions of the rib readily induce neuritic and hæmorrhagic foci immediately corresponding to the mal-adjusted rib; then the nervous involvement may extend along the ramus to the spinal nerve with a resultant pathological nervous involvement to correlated neurones and to corresponding viscus life. We have, also, seen how the upwardly displaced head of a rib directly impinges the spinal nerve at its exit, as well as the twisted vertebra or other vertebral lesions impinges through contiguous tissue strain the spinal nerve in its exit. Whether the vertebral lesion actually lessens the caliber of the spinal foramen and thus

obtsructs nervous conductivity, or there is induced a strain or bias on the immediate muscles and ligaments so that the firmly fastened fibrous tissue that securely surrounds and holds the nerve in its exit with a consequent interference of nervous force remains to be decided; we favor the latter probability, first, owing to the above anatomical features, and second, there can be but little motion in any one vertebral joint without straining contiguous tissues to a point of laceration, but the resultant strain and movement of several tissues will amount to considerable, just like the ultimate resultant effect at the focal point of several similarly mal-aligned, or gradually displaced, vertebrae will be considerable.

Dr. M. E. Clark informs us that it is his opinion, based upon dissection and clinical experience, that all nerves have a copious blood supply, and that practically in all pain the nerve is congested which is the cause of the pain. This is readily noted in sciatica, supraorbital pain, etc. Our dissections, experiments and clinical observations, as well as histological and pathological findings bear this out, although irritability of a nerve may be dependent, and often is, upon a lessened blood supply, we should remember the perverted physical state may be due to congestion and oedema and similar states where the nutrient supply is far below the normal. The ecchymotic and inflamed meninges at the superficial spinal nerve root and along the corresponding anterior commissure substantiates the thought that the osteopathic lesion affects the circulating fluids, by mal-alignment and mal-adjustment and contractured tissues, which in turn disturbs the functions of the neurone, or the recuperative power of *vis medicatrix naturae,* and of the compensatory forces in the body.

SOME CONFIRMATORY EVIDENCE.

Our experiments coincide, in a way, with the "nutrient reflex and sympathetic lesional hypothesis" of Clevenger. Clevenger bases his hypothesis mostly upon clinical and physiological data, comparatively little on pathological data, and not in the least on experiment in only so far as physiological revelation in the common physiological experiments supported his views. Of course, definite mechanical mal-adjustments in the ordinary osteopathic acceptance of pathological phenomena have not been approached in a comprehensive or even general way by either writers on spinal concussion or on allied topics. But the fragments of evidence that have been collected in support of mechanical injuries as causes of certain diseases is helpful confirmatory evidence in establishing the logic and science of osteopathic etiology.

So little is known of the pathology of the sympathetics that writers on nervous diseases are obliged to omit this part of pathology. Still, as Fox[23] has said "that the irritation in one organ can be reflected through a sympathetic ganglion as a center of a reflex arc is a fact that is the very essence of the pathology of the sympathetic nervous system," and some phenomena probably arise, not from reflex irritation, "but to definite abnormal condition of the peripheral nerves that affected the cord by lines of anatomical transmission." There is unquestionably a definite pathology of the sympathetics but very few experimentations and autopsy examinations have been executed.

According to Landois,[6] if a pressure or traction, or concussion of a nerve

results in an interference with the conducting elements (the axis cylinders), the conductivity of the nerve ceases. If there is a permanent disturbance of the molecular arrangement of the nerve particles, the irritability of the nerve is lost. The conductivity or irritability of a nerve may be lost without manifestation of irritation when mechanical influence acts gradually. Within the intact body persistence of normal irritability in a nerve depends first upon normal nutritive processes and the blood supply of the nerve. Insufficient nutrition is usually followed at first by an increase in the irritability. The irritability ceases only after advanced disturbance.

In osteopathic nerve lesions there is either an interference with the blood supply to the nerve tissues or else the axis cylinder is obstructed mechanically from direct pressure, stretching, concussion, or laceration. In any event it is the nutrition of the nervous element that first suffers, rendering conductivity abnormal. This means that blood disturbance from various causes is at the basis of osteopathic etiology. Inflammation probably in many instances is part of the history of these lesions. Thus nutrition is changed by certain exciting causes and by paralysis of vasomotors. Congestion and oedema due to obstructed vessels are important links in the pathological chain. Ranvier discovered that nerves become oedematous when the blood vessels supplying them were ligated. And then, traumatic alterations of the cord affects nutrition the same as nerve section. So much depends upon inflammation, and the factors that enter into flammation, and depends upon inflammation, and the factors that enter into inflammation, and not be amiss.

"1. Some source of irritation—cold, a blow, a burn, or a septic focus.

"2. The centripetal nerves, whether sensory or not, which are within reach of this irritation, are excited more or less violently.

"3. These nerves transmit to the vasomotor centres of the region the excitement which they have undergone.

"4. The tonic activity of these centres is disturbed and suspended more or less completely.

"5. Hence follows cessation or diminution of the tone of vessels that are subordinate to these centres.

"6. Consequently more or less considerable dilation of these vessels occur.

"7. But this vasomotor disturbance can only be considered as favoring the development of inflammation. It is only secondary in importance, and does not of itself suffice to make up the phenomena called inflammation. It places the vessels in a condition for easily and necessarily receiving more blood; it offers facilities for the emigration of leucocytes; but the initial phenomena of inflammation consists in the disturbance of the intimate nutrition produced in the organized living tissue. The vital condition of the tissues have been gradually altered by the previous state of its nutrition, and the peripheral resistance in the capillaries having been induced, the part is placed in a condition of vulnerability, and is ready at any moment to respond to morbid impressions. They may be reflex, as the impress of cold, or direct, as from the presence of germs; and the vasomotor action on the vessels, which without the previous alteration of the cell-nutrition would stop short at non-inflammatory congestion, is of enormous importance

in determining the various stages and symptoms of the progress of inflammation, although independent, and unconnected directly with the initial phenomena."[23]

Following the inflammatory processes of nerves, there may arise stages of degeneration, connective-tissue proliferation, scleroses, pigmentation, etc., which reveals a tremendous field for study, observation and experimentation.

Relative to the importance of the sympathetic system we have reasons to believe that it is to some extent independent of the cerebro-spinal cord, and, although the cord is not independent of the sympathetics, if a wide range of pathology based upon osteopathic concepts can be discovered here, it opens up a large field for medicine in general and osteopathy in particular. It should not be understood that we are intimating that the osteopathic lesion is necessarily confined to the sympathetics but rather suggesting the probability that an important field of our pathology lies here; besides still farther suggesting that what is true and applicable to one part of the nervous mechanism is more or less true of all, for as Humboldt said, "the actual miracle of the universe is the invariableness of the law." Still, science stops where evidence stops, and we should not "accept the physiology of a part for the philosophy of the whole," we can, I believe, safely apply to a certain extent the pathology of a part of one body structure to all of that particular structure.

That there are definite lesions to the sympathetic alone no one will doubt. There is no decussation of the sympathetics and as a result symptoms appear only upon one side of the head and body; this would not be true in cerebral lesions. Oppenheim has said that the motor and sensory derangements in Ericksen's disease have nothing to do with the distribution of definite strands of the cerebro-spinal nerves. There is considerable physiological and pathological data to support this statement. The vasomotor nerves having their centres and courses of distribution, opens an immense field for investigation. Time does permit us to digress on this important point. Clevenger has well said "that lesions of the spinal ganglia or rami communicates while paralyzing and congesting the vessels in the immediate vicinity of the lesion, induce distant sympathetic phenomena upon irritation of cerebro-spinal nerves elsewhere, as pupillary dilation from sciatic stimulation." Myosis may result from lateral curvature of the spine; note the sympathetic disturbances in tabes dorsalis; Kesteven reported a case where a hæmorrhage destroyed the rami communicates of the seventh dorsal sympathetic ganglion, which caused loss of hepatic and renal tone, imperfect peristalsis, etc., the course of involvement being through the splanchnic to the solar plexus disturbing the balance between the sympathetic or vaso-constrictor and the cerebro-spinal inhibitory actions.

Many interesting osteopathic illustrations could be given but the foregoing show the trend of the importance of lesions to the prevertebral ganglia. Lesions affecting the cord circulation can readily disturb the functions of both spinal and sympathetic fibres, of both vaso-dilators and vaso-constrictors, of both afferent and efferent fibres., the same as lesions to the rami communicates can readily upset the balance of spinal cord functioning. According to Langley[39] the cord between the first dorsal and the sec-

ond lumbar is of prime importance to the sympathetics for all motor and sensory tracts derived from the spinal cord and situated in the sympathetic make their exit here. Osteopathically we find extremely important lesions of the spinal column below the level of the cord; this would indicate that many causative lesions are to the nerve during or after exit.[40]

Vulpian in 1875 excited by the induced current a communicating branch passing between a ganglion of the sympathetic and the root of a spinal nerve and caused "constriction of the vessels that are visible on the surface of the cord in that part of its course which corresponds to the irritated nerve fibres." Likewise the same results followed when an intercostal nerve was irritated between the space where it receives a communicating branch of the sympathetic and of the spinal cord. The many isolated observations that could be given go to prove in a general way that there is a general dependent pathology of the cerebro-spinal and sympathetic nerves following direct anatomical channels and according to physiological principles. The efferent and afferent nerve roots with their corresponding neurones, and their contiguous rami undoubtedly will present a most interesting pathological picture when all the factors of osteopathic etiology are fully developed, for after all it is primarily a question of locating the origin of the disturbed nutrition and secondly of discovering the courses of anatomical conductivity and degeneration.

In this article all we hope to do is to show by very fragmentary references that there are good reasons to suspect a solid basis for osteopathic practice exclusive of so termed clinical empiricism. As has been repeatedly said there are many facts in medical literature supporting our claims, but there is nothing that even hints of Dr. Stills' philosophy that many diseases of various regions of the body are the result of external interference to the anatomical adjustment; still we should be cautious about too sweeping a statement relative to all diseases being due to external interference, for the body is a vital being subject to evolutionary and environmental forces and influences.

There is a wide margin for an osteopathic pathology based upon external mechanical interference alone. It is estimated that each spinal nerve of which there are sixty-two contain approximately eight thousand[41] strands, or say axones, and it is well known by physiologists and pathologists that all the fibers of a nerve cable are rarely involved *en masse* unless, of course, the lesion is a large one, but usually a few at one time. Then we should remember in connection with our pathology that an overworked function may result in a degenerative state of its controlling centres, or that body or other poisons may have a great influence in causing lesions; thus there may be some basis, but not a comprehensive one, for the applicability of medical gymnastics, that is, mechanical therapeutics for stimulatory and circulatory effects exclusive of osteopathy proper, and, also, for antidotal remedies.

To sum up the pathology of ramal lesions, which is as Clevenger suggests, "a lesion may be vascular, osseous, ligamentous, etc., and by extension or secondary implication destroy, or partially destroy, the nerve-root, or ramal, or ganglionary vicinity, and only make itself apparent when months had elapsed." Sympathetic lesions do not necessarily produce immediate symp-

toms owing to the partial dependence of that system and to the cumulative effect of a lesion. The lesion disturbance may increase very rapidly and pass to an inflammatory stage or the congestive condition may persist for weeks or months. In these long standing cases positive degenerations are very apt to occur. The lesion may run into a carious, periosteal degradation, connective-tissue proliferations, arterial scleroses, etc.

Spastic conditions of the cord-vessels, according to this author, account for spinal irritations. In certain cases of concussion there may be sprain of the vertebrae and rib ligaments with a rapid disappearance of all congestion; Moullin, Hamilton and Dana also suggest that in some cases the spinal column tissues may be sprained. Owing to the spinal nerve-roots being more stoutly enveloped than the rami communicates, they are not as subject to irritation.

"Erb,[25] Berlin, and others suggested ecchymoses in the cord to account for the symptoms similar to those occuring in the sclerotic or retina when the eye was bruised. Transfer those small capillary extravasations to the ganglia bodies, the connective-tissue capsules, ligaments, and vertebral periosteum possible thereabout from a concussion, and the irritations are carried into the cord and will become as manifest as though located directly therein.

"Such extravasations may subsequently clear up as readily as they do in the eyeball. But vessel-rupture, hæmorrhage great or little is not necessary to the production of sensory troubles in that vicinity; irregular blood-supply from a deranged vasomotor region is fully sufficient. A turgescence, such as could readily occur from the blow or fall, whether the sympathetic strands or ganglia were damaged or not, would set up pain and general symptoms as readily as a swollen muscle can reflexly cause general disturbance."

Arterial scleroses may appear in after years, for degenerations are as likely to occur in the arterial walls as in voluntary muscles when cut off from "trophic" influences.

It may be well to state that the present attitude of the medical profession toward the subject of spinal concussion is a peculiar and vexed one. By the generic term concussion of the spine "is meant a more or less complete annihilation of the functions of the spinal cord, immediately consequent upon an injury in character, and unattended by any discoverable gross lesion."[42] The term concussion is becoming more and more limited in its application, due to the discovery that so-called "railway spines" often present definite sprain of muscles, fascial, and ligaments, and twists of the vertebrae with some probable cord or spinal nerve injury, or hæmorrhage into cord, membrane, or nerve sheath. The explanation that there is a molecular disturbance of nerve matter has been used as a hypothesis for the lack of a better one owing largely to previous comparatively inexact methods of diagnosis. We are not making an apology here for the use of the term but have employed it on the one hand according to the historical usage of older writers, but on the other hand in a much more important way (to us) as evidence that traumatism to the spinal colum, whether of the character of concussion to the cord, of sprains, of compression, or what not, is a very potent cause of disease and always has a tangible structural

pathology. Consequently it matters not to us, just for the moment, whether spinal concussion in its narrow meaning is a fact or not. There may be no obvious structural defect in a few cases where the jolt or injury is received by the cord alone owing to certain anatomical peculiarities, viz., the small size of the cord as compared with the diameter of the spinal canal and the nature of its suspension by the denticulate ligaments and the spinal nerve-roots. Even spinal concussion in its generic sense may not exist. Still we believe there is almost invariably some structural change in the spinal column which affects, directly or indirectly, immediately or in after time, mechanically the blood supply or nutrition of the allied nervous elements.

Through all the mass of case reports from the older writers as Abercrombie, Griffin, Lindell, Webber, Holmes, Leyden, Bernhardt, Erb, Ericksen, and others, to present-day authors as Clevenger, Dana, Hamilton, Golebiewski, Bailey,[30] coupled with the definite experience of all osteopaths, there is certainly much data to justly hope for a comprehensive pathology based upon the fundamental principles of the osteopathic concept of disease. All physicians are realizing that instances may arise when the vertebrae may be considerably disturbed without necessarily producing fatal results or even very serious symptoms,[43 44] although all will concur that serious disorders are the rule, still the fact that vertebrae can be disordered with any degree of impunity has heretofore been much questioned. Therefore, we can safely state that the body structure can be mechanically, osteopathically, disturbed to the point of producing remote pathological effects. However, one salient fact always stands foremost, the importance of a lesion derangement rests primarily with the relation of the affected part to the whole.

Traumatic effects as revealed by osteopathic clinicians and by experimental evidence of the character of nerve tissue congestion, inflammation, and hæmorrhage, and finally degeneration and traumatic compression resulting in nerve-tissue ischaemia and degeneration as recorded by Landois and other physiologists as well as by osteopathic observations, and all evidence by our fraternity through the principle observed by Head that deep organs may be influenced by manipulation of cutaneous sensory nerves derived from the same segment of the cord, and, also, if the effect is severe enough, to collateral neurones, contains a tremendous field for study.

The objects of this address will be attained if first, we have shown that there is hope of a future scientifically demonstrated osteopathic pathology, and, second, if we have given a slight impetus to our fraternity in that direction, but through all our work let us remember the words that Darwin once expressed to Haeckel, "we must beware not to make science dogmatic."

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IMPRESSIONS OF THE DENVER MEETING.

Expressions from a Few Who Were Present.

The Denver meeting was the best we have held, but the programme was too full. I did not hear half the papers and those I did hear were not thoroughly discussed because of lack of time. I enjoy the full discussion of papers because the points are thoroughly brought out.

There was abundance of clinical material but no opportunity for all to see and discuss the cases. I hope the next programme will give ample opportunity for discussion. DAIN L. TASKER.

Los Angeles, Cal.

Since the meeting in Chattanooga in 1900, I have attended all the annual meetings of the National Association, and the meeting at Denver, was, in my opinion, osteopathically considered, one of the most instructive and entertaining of the meetings. The clinic feature was especially good, and Dr. McConnell's address blazed the way for an osteopathic pathology in the near

future, and this will be one more of the many important things being done to put osteopathy in the highest rank in the scientific world, where it is sure to go. J. ERLE COLLIER.

Nashville, Tenn.

The wife of one of the most prominent among the osteopathic physicians characterized the Denver meeting as being a gathering where "every one was trying to find out what was right." Personalities were almost entirely obliterated. The true scientific spirit was shown on every hand, and on the convention floor was exhibited a tolerance of the opinions of others that will contribute much to make osteopathy the greatest science of the world. Probably at no other meeting have the members felt so well repaid for coming. The feast of instruction far surpassed one's capacity to receive. At the parting hour everyone declared that he would certainly attend the meeting next year at Put-in-Bay.

The arrangements and entertainment secured by the local committee far surpassed anything ever known before in the history of the Association. The meeting marks another milestone in the advance of our splendid profession.

St. Paul, Minn. C. W. YOUNG.

This was the first A. O. A. meeting I have had the pleasure of attending. It was a grand success in every way, it is true I cannot endorse one or more papers we had, but with that exception it was far beyond my anticipations. I would suggest more clinics at our next meeting. It was a grand privilege to meet the Father of Osteopathy, who blazed the path through the wilderness of skepticism and prejudice. It was he who stood like a Gibraltar in the storm of ridicule; it was he who stood the abuse of the old school of medicine; it was he who asked the help of none but God. He held that God had made man a perfect machine, and thoroughly understanding the anatomy of man, he had the key to health.

Words cannot express the debt we owe our Father Dr. Andrew Taylor Still. His name will go down in history as the grandest man of the twentieth century. He will be in company with such men of science as Huxley, Newton, Fulton and Edison. Therefore, there should be no surprise when we osteopaths get enthused. We feel elated to have the grand privilege of holding the Andrew Taylor Still banner high, with the motto inscribed thereon, *"Lesion Osteopathy; Pure and Simple."* WM. H. COBBLE.

Fremont, Neb.

The Denver meeting was the most harmonious and successful ever held. The well managed and hospitable reception of the Colorado Osteopathic Society, the able handling of the programme and the abundant supply of clinical material were all factors contributing to the satisfaction of those attending.

The most notable event and perhaps the one of greatest interest to the profession at large was the presentation by Dr. McConnell of absolutely scientific proof of osteopathic etiology.

Denver's location was doubtless responsible for the absence of many. The attendance, however, was between three and four hundred. There now being over one thousand members in the national organization and the place for

the next meeting being centrally situated the attendance at Put-in-Bay should be greater than that of any former meeting. In order that this will not lessen the opportunity for bringing out the practical experience of those present, some change in the character of the programme may be advisable. A programme giving less time for theoretical and lengthy papers and more to discussion would furnish a greater extent of practical information than could otherwise be obtained. CHARLES E. FLECK.

Orange, N. J.

The Denver meeting of the A. O. A. was one of the best in the history of our organization. Not so large an attendance, perhaps, as some others, although very satisfactory; yet there was a noticeable spirit of unity which is unique in our history. I do not mean to infer that we were entirely of one mind. There were differences of opinion—widely different in some instances. Yet those very differences were the means of bringing out and unifying the best thoughts in our profession. It seems to me that there was more evidence in this meeting to show the stability of osteopathy, to establish the fact that there is a principle, a philosophy, in our science than in any previous one. A few mistakes were made in the programme, which all of us now can see. Yet is it not true that the discussions which they produced were the means of more thoroughly grounding us in the basic principles of the science? After having attended every meeting of the association since its organization, I am more thoroughly convinced than ever that many fail to appreciate the advantage offered by these annual gatherings. Another large class are the losers by failing to join. Let us all pull together for another year, so that we may make the Put-in-Bay gathering a record-breaker in quality and quantity. We have passed the thousand mark in membership. It ought to be two thousand. Begin plans now for next year. Then stick to the plans. Fraternally Yours,

Columbus, Ohio. M. F. HULETT.

As the A. O. A. is a working body composed of those thoroughly interested in osteopathy and generally willing to subordinate private interests to public osteopathic. The discussions, with one or two exceptions, showed a more in interest and influence. The Denver meeting was the greatest yet held. The programme was comprehensive and well carried out. The abundance of clinical material and the direct way in which most of it was handled were noticeable features. There was not much time wasted giving antiquated or purely medical theories, and the treatment proposed was generally purely osteopathic. The discussions, with one or two exceptions, showed a more thorough grasp of the osteopathic idea and practice than at any previous meeting. That osteopathy is able to cope with disease in almost every form was shown by the testimony of those who had been cured or helped as well as by the testimony of osteopaths.

President McConnell's address deserves special attention. We will all be glad to see it in print fully illustrated. It marks an era in osteopathic investigation on a scientific basis. It is hoped that it will act as a stimulus to work along that and other lines in our colleges.

The reports of the standing committees elicited as much interest as at previous meetings, but did not provoke so much discussion. The policy of

the association seems to have assumed a definite shape, so that some of the former radical differences of opinion did not crop out in the reports or the discussions. But there was no evidence of lack of interest or any disposition on the part of the members to allow important measures to pass unnoticed. The man that wanted to be shown was in evidence. May he always be with us! E. R. Booth.

Cincinnati, Ohio.

TO THE MEMBERS OF THE A. O. A., GREETING.

The close of the Denver meeting marked the end of a highly successful year in the history of the A. O. A. It saw the membership above the one thousand mark, a fairly good balance in the treasury, and substantial advancement made along scientific lines. It should be the earnest endeavor of each member to make the coming year a better one for the Association in every respect. We must never be content to rest upon past achievements, but should resolve to press nearer to the goal each year.

More money will be put into our publication during the coming year than in the past. The Journal will consist of 48 pages monthly. Any member of the Association who has any idea to suggest that he thinks will be for the good of the cause, or who has learned any new scientific fact is urged to contribute it to the Journal. It is expected that four series of case reports will be printed, and all are urged to help in this work. The Year Book or Osteopathic Annual will be issued about January 1, and an extra effort will be made to have the directory feature of it as accurate as possible.

The educational work of the profession is progressing satisfactorily. In all recognized schools the three years' course will be operative this fall. The A. O. A. holds to its ideals and there will be no departure from the course it has mapped out. It will, so far as practicable and possible, exercise a wise and just superintendence over educational affairs. The relation between the colleges and the profession are harmonious. The interdependence of the one upon the other is recognized by all, and the A. O. A., through its committee on education, will work with the colleges in a spirit of mutual helpfulness.

For the first time the Association has agreed upon the provisions of a bill regulating the practice of osteopathy and will use its best endeavors to have it enacted into law in those states where legislation is needed. This bill will be printed in an early number of the Journal and it is hoped that all members will read it, think about, study it, and, if need be, discuss it during the coming year to the end that we may become united in sentiment and that our future legislation will be as nearly uniform as circumstances will admit. We have a year in which to prepare for a legislative battle, which we have every reason to expect will be fiercer and more stubbornly contested than any we have yet known. Let us fully agree upon what we want then build up our membership, put money in our treasury, and be prepared to get what we want. "In time of peace prepare for war."

There is work for each member to do. There are duties that devolve upon all alike. The duty that lies nearest at hand is to pay the annual dues. Let

all do this at once and the vexed questions of back dues and reinstatement will be laid to rest. It is not given unto all of us to do brilliant research work such as Dr. McConnell announced in his masterly presidential address — work which well lays the foundation for a distinctly osteopathic pathology — but there are ways in which all can aid in scientific research work. Every member can, and should, carefully record all cases treated, and report the interesting ones to the department of case reports for publication. It will take a large number of these to positively confirm osteopathic ideas of etiology and diagnosis and they will suggest lines of work for research students. Then, again, by paying dues promptly and using every legitimate means to recruit our membership from the ranks of worthy osteopaths each member will be materially contributing to the resources of the Association. They will be supplying money to sustain and improve our publications, and will provide the nucleus for a fund needed to maintain research students. The latter is a work which the Association must take up, and the sooner the better. We have no wealthy members who are able to devote their time to such investigation, and inasmuch as the benefits derived from such labors inure to us all, why should not the profession in its organized capacity provide a living for those who are competent and willing to devote themselves to this work.

It is true that the A. O. A. has a higher mission than the mere acquisition of members. Its success is not to be estimated by the number of names on its roster, and yet there is such a vital relationship between the number of its members and the work it will be able to accomplish that it seems to me during the coming year, at least, that while no line of work should be neglected, our greatest efforts should be put forth in the direction of a largely increased membership. Increase of numbers means increase in influence as well as an augmentation of our resources, and influence and money are needed for the successful prosecution of any cause, however just and worthy.

Let us all work together during the coming year as never before. When we assemble again in annual meeting there should be at least twenty-five hundred names on our roster. They should be the names of osteopaths actuated by the sincere desire to place osteopathy where it belongs—in the front ranks of the therapeutic systems of the earth.

A. L. Evans,
President A. O. A.

Treasurer's Notice.

A. O. A. dues for the year 1905-6 are now payable. Will those who are in arrears please be prompt in making their remittance, as it is necessary to revise the roll of members, and the Journal list of subscribers soon. The constitution provides that all who fail to pay dues for the current year within three months after the annual meeting shall be dropped from membership. Much clerical work is involved in keeping the Treasurer's, Secretary's and Editor's lists correct. You can greatly assist them in reducing this labor to a minimum by a prompt response to this request. Send all remittances to the undersigned.

M. F. Hulett, D. O.
Treasurer.

Columbus, Ohio.

A healthy old fellow, who is not a fool, is the happiest creature living.—Steele.

APPLICATION FOR MEMBERSHIP IN THE A. O. A.

DR. H. L. CHILES, Secretary A. O. A., 118 Metcalf Building, Auburn, N. Y.

Please present my name to the Trustees as an applicant for membership in the American Osteopathic Association.

I enclose Five Dollars ($5.00), the membership fee, with the understanding that it is to be returned in case my application is rejected.

In case I am elected to membership in the A. O. A. I promise to comply with the requirements of the constitution and to deport myself in accordance with the principles embodied in the code of ethics.

Immediately prior to beginning the study of osteopathy I was a resident of (town or city) ..... (state) .....

where I was engaged in (business, vocation or profession) .....

..... at (street and No.) .....

.....

I attended ..... College of Osteopathy during my first semester, date..... I attended.....

.....College of Osteopathy during my second semester, date ..... I attended.....College of Osteopathy during my third semester. I graduated from.....

College of Osteopathy, date.....

I began the practice of osteopathy at.....

I have since practiced in the following places.....

.....

.....

.....

.....

.....

.....

.....

I am now practicing at (street No., or office building and No.).....

..... (town or city) .....

(state) ..... Signature (as I wish my name to appear in the A. O. A. directory) .....

NOTE.—No application will be acted upon by the Trustees unless it is accompanied by the membership fee, such fee to be dues for the current year.

Each applicant for admission to membership must be vouched for in writing by two members of the A. O. A., who are residents of the same state as the applicant.

The above applicant is recommended by

1. ....

2. ....

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Date.....

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SEPTEMBER, 1905

The Denver Meeting.

"It was the best meeting we have ever had." This expression applied to our meetings is trite, but ever true. Why should we not learn from past experience and make each meeting better than the preceding one? Progress is the watchword of osteopathy.

The opening meeting on Monday night was well attended and the programme was carried out as announced, even to the address of welcome by Hon. Robert Speer, mayor of Denver, who, with the exception of Mayor Dockery of Kirkville, has the distinction of being the only mayor who ever extended a personal welcome to the A. O. A. In addition to the programme as published a male quartette sang several songs, one of which, "Vive La A. T. Still," was particularly enjoyed. The "Old Doctor" appeared at this meeting and made a brief address. He was received with unbounded enthusiasm.

All of the sessions were well attended, which demonstrated the fact that

members were present not only to advance the cause of osteopathy, but to derive personal benefit from hearing the numbers on the programme.

Where several hundred alert, educated, thinking people are gathered together there are bound to be differences of opinion, and this meeting was no exception. It was noticeable, however, that all contested points were discussed with perfect good humor. It has been demonstrated that in osteopathic meetings personalities can be excluded, and men can differ without bitterness.

The principal points in the reports of the three standing committees were as follows: The Committee on Publication recommended that the JOURNAL be enlarged to forty-eight pages. It was recommended by the Committee on Education that the A. O. A. supervise the preliminary examination of matriculants in recognized colleges of osteopathy. The Committee on Legislation presented a model bill and recommended that it be adopted and that the A. O. A. use its influence to have the provisions of this bill embodied in future legislation. All of the above recommendations were adopted.

Dr. L. E. Cherry, chairman of the Committee on Prize Essay contest, explained the method adopted by the committee in grading papers and announced that it was found that Dr. A. L. Evans was the author of the winning paper, the subject being "What Is Osteopathy?" Owing to lack of time the essay was not read but will be printed later in the JOURNAL.

All of the proposed constitutional amendments were voted down in conformity with the recommendation of a special committee that had been appointed to consider them.

A resolution was adopted relative to the establishment of an Osteopathic Hall of Fame in the new hospital building at Kirksville, commemorative of those members of the profession who have rendered especially marked service in establishing the principles of osteopathy.

The election of officers resulted as follows: President, A. L. Evans, Chattanooga, Tenn.; First Vice President, John T. Bass, Denver, Col.; Second Vice President, Lena Creswell, San Diego, Cal.; Secretary, H. L. Chiles, Auburn, N. Y.; Assistant Secretary, C. A. Upton, St. Paul, Minn.; Treasurer, M. F. Hulett, Columbus, Ohio; Trustees, C. B. Atzen, Omaha, Neb.; T. L. Ray, Fort Worth, Tex.; Cora N. Tasker, Los Angeles, Cal.

Put-in-Bay, Ohio, was chosen as the meeting place for 1906 and the opening date for meeting, as fixed later by the trustees, is Aug. 6.

As is usual at meetings of the Association the Trustees held many sessions and found much to do in considering the reports of the committees, passing upon applicants for membership, auditing the accounts of the Treasurer, allowing bills, etc.

The committees provided for by the constitution were elected by the trustees for the ensuing year, and are as follows:

Committee on Publication, Chairman, W. F. Link, Edythe F. Ashmore, Carl P. McConnell.

Committee on Education, Chairman, E. R. Booth, W. B. Meacham, J. L. Holloway.

Committee on Legislation, Chairman, A. G. Hildreth, Dain L. Tasker, Chas. C. Teall.

The Committee on Publication was directed to arrange with Dr. H. S. Bunting, Chicago, to publish the year book for the coming year.

That pride of ancestry which makes a person want to do the right thing, to live true to, and worthy of, the teachings of his parents and to keep the family name unsullied is a commendable trait. But such pride becomes ridiculous when one is continually harping upon it and seems to rely upon the deeds of his ancestors rather than his own for his position in life. In this strenuous work-a-day world people are not so apt to inquire who was your father, as what can you do?

Very similar to this is pride in one's alma mater, a commendable thing in itself, but apt to be overworked in professional life. No one can reasonably object to the exercise of a spirit of loyalty on the part of the alumni of a school, but pride in, and loyalty to that school is one thing and the attempt to belittle the alma mater of others is quite another thing. The result of such a course in professional life is bound to be the same as that occasioned in private life when one man reflects upon the ancestors of another, and that is—trouble.

There seems, unfortunately, to be a disposition on the part of a few in the osteopathic profession to create and foster the impression that their alma mater is the only real osteopathic school in existence. We do not, for a moment, believe that any school teaches such a thing to its students, albeit they each in their catalogues and advertising matter set forth, as they have a right to do, their individual and particular advantages, and doubtless each has these. It is possible that some schools are not what they should be in every respect, yet it is absurd to claim that any of them is the only school where osteopathy can be learned. The facts do not bear out any such idea. There are good otseopahts from all recognized schools as well as some poor ones, and we trust that this fact will become universally recognized and that each osteopath will be freely accorded the place which by his own ability, integrity and industry he earns for himself. Any clannishness or drawing of school lines will weaken that spirit of catholicity and feeling of brotherhood which ought to characterize our great profession.

We are informed that one-third of those recently applying for matriculation in the Massachusetts College of Osteopathy have been refused admission on account of poor educational qualifications. The educational qualifications of those who seek to enter our colleges should be most carefully watched. The best way to preclude the harm which comes to the profession through unqualified and ignorant practitioners is to guard the portals of the colleges. This college will henceforth require two years personal attendance of all M. D's., no matter from what school graduated. This, too, appears to be a proper regulation. A physician educated along entirely different lines will require two years to become fully imbued with osteopathic principles, and to acquire the osteopathic technique.

We will keep the address of Dr. McConnell, which appears in this number of the JOURNAL, in type long enough to give all who may desire copies of

it in pamphlet form an opportunity to be heard from. If a sufficient number are wanted to warrant the expense they will be put in pamphlet form and sent post paid for five cents per copy. The address may be a little too technical for the ordinary layman, but it will certainly appeal to those who have any scientific attainments. Doubtless every osteopath would be glad to present a copy to a few such friends. Let us know at once how many copies are wanted.

It was our privilege while in Denver to examine the electrical illuminating device advertised in this number of the JOURNAL. Accuracy of diagnosis is the key note of osteopathic success and this instrument most certainly throws great light upon this important branch of our work. It is used solely for diagnostic purposes and we believe that it would prove a valuable addition to the office equipment of any physician.

The hospital which is now being erected by the American School of Osteopathy at Kirksville will probably not be completed before January 1. The building will be 79x108 feet, three stories, and will include a theater for general operations and rooms for private operations. It will cost between thirty and forty thousand dollars.

Only one session of the national organization of Osteopathic Boards of Examiners was held at Denver. Nothing of importance was accomplished. Owing to the lack of uniformity in the laws of the various states the members were about equally divided in opinion as to the advisability of discontinuing the organization.

Through a mistake of the printers, which no one regrets more deeply than the editor, the advertisement of the Massachusetts College of Osteopathy was omitted from the August number of the JOURNAL. It occupies its usual space this month and we expect to see that no such error occurs again.

Dr. Booth's book, "History of Osteopathy and Twentieth Century Medical Practice," is now being delivered to purchasers. We have received a copy but have not yet had the pleasure of reading it. We expect to have more to say about this work in the JOURNAL for October.

With this number the fifth volume of the JOURNAL begins. This volume will contain many valuable papers. We would suggest to members, therefore, that each number be carefully filed away so that at the end of the year they may be bound and preserved.

We print this month the impressions of several who attended the Denver meeting. We would be glad to continue this feature in the October number if there be any who care to contribute.

The Brown Palace hotel proved to be an ideal place for our meeting. The

management generously gave us ample room for all purposes, and the service generally was excellent.

The secretaries of state associations would confer a favor upon us by notifying us, at least one month in advance, of the date of the next meeting of their associations.

The American School of Osteopathy has acquired the interests of the Atlantic School, formerly located at Buffalo. The latter school will be discontinued.

ASSOCIATION NEWS AND NOTES.

Now is the best time to begin the campaign for new members.

The absence from the Denver meeting of three members of the Board of Trustees, Drs. Melvin, Ellis and Gravett, was noted and much regretted.

An attendance of between three and four hundred members at Denver, considering its far western location, speaks volumes for the earnestness and loyalty of the A. O. A. membership.

A full report of the proceedings of the Denver meeting will be made up from the stenographer's notes, which have not yet been received, and will be published in the JOURNAL for October.

One notable feature about the programme of the Denver meeting was the number of comparatively new names on it and the excellent work that most of these members did. The A. O. A. has talent that it knows not of.

The prize essay contest will be continued. Those who have contemplated entering the contest, and we hope there will be many, need not delay work on their essays. The terms of the contest, names of judges, etc., will be announced in the October JOURNAL.

Those elected to membership in the A. O. A. since May 14, 1905, will have no dues to pay until the meeting at Put-in-Bay. From all other members five dollars is now due. This should be sent at once to the Treasurer, whose address appears in this number of the JOURNAL.

At the St. Louis meeting there were six members present who had attended all meetings of the A. O. A. The much regretted absence of Drs. C. M. T. Hulett, S. S. Still and Irene Harwood Ellis from the Denver meting cuts down the list of those who have attended all meetings held to date to three, viz.;A. G. Hildreth, C. E. Still, and M. F. Hulett.

We print this month the names and addresses of sixty-six new members elected at Denver. These names with their office addresses are included in

the directory which accompanies this number of the JOURNAL. We want each member to look up his name and if there is any error in the spelling of name or address to send us the correction promptly.

Dr. McConnell, retiring president of the A. O. A., is the new member of the Committee on Publication and will have charge of the preparation of the programme for the next meeting. He will doubtless be glad of any suggestions that will aid him in getting up a programme, which it is hoped will be better than any that has yet been carried out.

In arranging for the meeting the osteopaths of Denver did themselves proud. The local practitioners seemed to work together in perfect harmony and the result was the best arrangements ever had at any of our meetings. There were more clinic cases on hand than could properly be presented, and in every way the Denverites proved equal to the occasion.

The sight-seeing trips which were arranged for by the local osteopaths seemed to be thoroughly enjoyed by all. A few seemed to think there was a possibility of their distracting attention from the work in hand. But we believe that the opportunities for social intercourse which they afforded and relaxation they permitted rendered the minds of members better able to receive and retain the good things in which the meeting abounded.

Dr. A. T. Still was in Denver to attend the sessions of the A. O. A. It was much regretted that he only felt able to attend one session, the opening one, on Monday night. While in Denver he was the guest of Drs. N. A. and Nettie H. Bolles. Through the latter he sent word to the Association that he feared he was becoming something of a "home-opath." We are glad to say that he reached home safely and is now feeling very well.

It has been suggested that the transactions of the annual meetings, including the papers, discussions and clinics, be printed in one volume as soon after the meeting as possible and distributed to the members of the A. O. A. The idea meets with much favor, but owing to the expense and other considerations it was not deemed practicable to undertake it this year, but it is more than probable that this will be adopted for future meetings.

Those engaged in the work of recruiting the membership, and we trust this will include every member, should remember that every person elected to membership before May 6, 1906, will receive a certificate of membership, the year book, and all the journals, directories, and case reports issued, or that will be issued, during the current year. Those elected after May 6, will only receive the publications issued after they become members, but will have their membership extended one year from the following annual meeting. Inasmuch as the latter will miss the report of the Denver meeting as well as most of the papers read there, discussions of them, as well as reports of clinic cases demonstrated, there is no reason why any one should defer joining the Association.

We print this month a copy of the new application blank which was adopted by the trustees at Denver. It will be seen that it provides for going more deeply into the history of applicants than did the blank formerly used. In addition to the safeguards therein provided, the Trustees have decided to print the names of all applicants in the JOURNAL before voting upon them. This will give any member an opportunity to file a protest with the secretary in case unworthy persons seek admission to the Association. No worthy osteopath will object to the closest scrutiny of his personal and professional history, and the other kind—well, it is the other kind we want to look out for.

Including reinstatements there were 79 additions to the A. O. A. membership at Denver. Of these Colorado furnished 11, New York and California, 10 each; Missouri 9, Illinois 6, Iowa 5, Kansas 4, Nebraska and Washington, 3 each; Tennessee, Texas, Wisconsin and Pennsylvania, 2 each; Georgia, Oregon, North Carolina, Utah, Minnesota, Indiana, Michigan, Oklahoma, Alabama and Canada, 1 each.

Fifty one of these were graduates of the American school; 11 of the S. S. Still college; 6 of the California college; 4 of the Northern Institute; 2 of the Milwaukee college; 2 of the Southern school, and 1 each of the following: Pacific college, Philadelphia college and American College of Osteopathic Medicine and Surgery.

It has been suggested by several members lately that the names of the officers, trustees and constitutional committees should be kept standing in the JOURNAL, so that members having business with any of them would always have their addresses at hand. It is true that these addresses appear in the directory but as it is now issued only quarterly, and often becomes misplaced in the office of the practitioner, it will doubtless be found advantageous to adopt the suggestion. Accordingly the official roster will be made a permanent feature of the JOURNAL.

It should be borne in mind that dues should be sent to the treasurer, applications, together with the fee, should be sent to the secretary, while the editor, whose address will be found at the head of the editorial department, should be notified of all changes in the addresses of members.

Make the New Year Book Accurate.

Having been entrusted by the trustees of the A. O. A. at the Denver meeting with the arduous task of preparing a year book that will contain an official directory of all legitimate osteopaths in practice, I herewith urge the presidents and secretaries of all state osteopathic societies to lend me their prompt co-operation.

It is the universal wish of the profession that the next osteopathic directory printed will be accurate, up-to-date and complete. I am ready to make it so if I can enlist the help needed, both to revise the present lists and read the proofs I will submit in due season. Not only are the officials of state and local osteopathic societies urged to give their aid, but all public-spirited osteopaths who are willing to lend a helping hand. Is the list of your city and state correct as far as you know the facts?

Please make a note of all errors of omission and commission in the year book of 1905 and send the same to me promptly. If you see any name incorrectly spelled, initials wrong or address faulty, please send the correction to me, stating the number of the printed page of the 1905 year book on which the error is found. If your name is omitted or that of any other legitimate osteopath, also notify me, giving school, year and present address.

The osteopathic profession has never yet produced a complete, authoritative and satisfactory directory. It is sorely needed. I pledge the profession to spare no time or toil to furnish it by January, 1906, if I may have the assistance of those whose help I have a right to expect. Faithfully and fraternally,

HENRY STANHOPE BUNTING, D. O., Editor.

171 Washington street, Chicago, August 24.

Insurance Recognition.

Members of the A. O. A. will be interested to learn that osteopathy has been officially recognized by a great insurance company. To the best of my knowledge no insurance company has up to this time ever asked for an osteopathic examination in the settlement of a claim. If I am incorrect I should like to be informed. In this case I was called by the company and informed that they had had several medical examiners' reports, but that they were not quite satisfied and wanted to break all precedents and secure an osteopathic examination. When it is stated that the claim was settled on the spot for exactly the amount recommended in the osteopathic report, there is no need of further comment.

Boston. RALPH KENDRICK SMITH, D. O.

EPITOME OF CURRENT LITERATURE.

Under this title will be found a brief outline of the more important articles in current periodicals. These outlines will, in no sense, be a substitute for the periodicals quoted, but will serve rather as an *Index* to the best work in our growing osteopathic literature.

Thoburn and Gardner, (Brain, Vol. 26, 1903.) "Tumor of the Axis."

Report of a case of sarcoma of the body of the axis, growing very slowly over a period of four years, which compressed the cord on the left side between the second and third cervical vertebræ. The motor symptoms consisted in paralysis with marked wasting of the sterno-mastoid and trapezius on the left side and an affection of the left eye due to destruction of the left motor nucleus. The left phrenic nerve was completely paralyzed.

E. Barg. (Zeitsch f. Kun. Med., Vol. 50, No. 203), "Chronic Spinal Rigidity."

Chronic spinal rigidity—Describes some extreme cases of spinal stiffness due to muscular action alone. The stiffness prevented the patient from working and robbed him of sleep. Flexion and extension of the spine are absolutely impossible and on percussion the muscles are at once thrown into a spastic condition. Under chloroform there was complete relaxation of the muscles. The author adds, "It is impossible that the stiffness and pain are due to hæmorrhage into the subarachnoidal space, with subsequent pressure upon emerging nerves, since occasionally blood is found on lumbar puncture."

Walton, G. L., in "Studies in Neurological Diagnosis," by Putnam and Waterman, Boston, 1902.

Report of a case. A man, a cook, single, age 35 years. On Jan. 3, 1885, fell backward down a flight of steps, striking his neck on the edge of a door post. Head thrown forward with chin elevated. In this condition when he entered hospital. Unconscious six hours. In bed a month. Entered hospital March 30. Complained of position of head, pain in back and shoulders and weakness.

There was a marked prominence over the fourth cervical. Projection felt in posterior wall of pharynx. Patient walked with spastic gait. Reflexes increased, grasp weak. No atrophy. On April 2, head was extended under ether. Position of vertebrae improved. Splint applied. No permanent improvement. Month later failing after two and a half months extension tried again, ten months after accident helpless, had to be taken to almshouse. Fifteen months after accident while taking lukewarm bath, ice cold water meanwhile being thrown on back with syringe, patient felt a sensation like electric shock. Next morning could rise in bed. Month later working in a restaurant. Three years after accident gait normal, reflexes normal, head held rather stiffly, no prominence in posterior pharynx.

Note long loss of function and yet recovery when pressure was removed.

Catalogues of the "American School of Osteopathy," and the "Pacific College of Osteopathy."

These two publications show a marked improvement in bookmaking as well as in the work offered in the courses. Query—Are pictures of gynecological clinics under full sail an essential part of a school catalogue?

Editorial. (British Medical Journal, July 22, 1905.)

"Osteopathy is one of the many inventions in the domain of quackery which testify

at once to the ingenuity of the American mind, and the credulity of the American people, although as far as we are aware it has not yet found its way across the Atlantic, the system has many adherents in the United States and in more than one state they have attempted to secure legal recognition."

The editor then relates the story of the recent legislative campaign in Pennsylvania and then quotes at some length from Dr. Still's "Autobiography," and his "Philosophy of Osteopathy." He then quotes as pertinent the objection of the governor of Pennsylvania that the good of the system should not be withheld from the use of regularly qualified practitioners.

Littlejohn, J. M.: "The Theory of Lesions and Their Treatment." (The Osteopathic World, July, 1905.)

"How do we get these partial lesions, luxations or a complete dislocation. Outside of the one possible cause traumatic, the only way that a lesion can be produced is in connection with the soft tissues * * * I do not believe there is any other way in which the osseous lesion can be absolutely primary unless it is traumatic. But how does the ninth dorsal get out of place, supposing injury is excluded? Well, it gets out of place because the muscles, ligaments, tendons, etc., get into abormnal conditions contracted excessively relaxed, or in a state of mal-nutrition. * * * That being the weak point in the soft tissue, where you have tension or lessened tension, the vertebrae will get out of place by compensation, and that is the reason why you get these osseous lesions—no. primary, but secondary."

PERSONALS.

Born, to Drs. L. E. and Grace Wyckoff, Los Angeles, Cal., Aug. 20, 1905, a son.

Dr. Chas. Hazzard has returned from Panama after a very pleasant and interesting trip.

Dr. V. P. Urbain is now associated in the practice with his sister, Dr. Mary Urbain, at Hamilton, Ohio.

Dr. H. M. Gifford, Louisiana, Mo., has recently recovered from an illness due to sapremia, which kept him from work about two months.

Anyone having a copy of No. 1, Vol. II, JOURNAL A. O. A., who does not care to bind it will confer a favor upon Dr. J. J. Schmidt, Danville, Ill., by sending same to him.

Dr. F. P. Young of Kirksville, Mo., who was taken ill at Denver, while attending the A. O. A. sessions and had to return to his home before the close of the meeting, is reported as entirely recovered.

Drs. Clara C. F. Wernicke and Orella Locke, of Cincinnati, have dissolved partnership. The former retains the office at 55 Haddon Hall. Dr. Locke has taken offices at 11 Cumberland Building.

Dr. George M. Laughlin has retired from the editorship of the *Journal of Osteopathy* in order to devote more time to study and to work in the school. Dr. R. E. Hamilton succeeds him as editor.

Drs. F. D. Parker and C. A. Upton, osteopathic physicians, have entered into associate practice, retaining the suite of offices occupied by Dr. Parker for the past eight years, 708 New York Life building, St. Paul, Minn.

Dr. R. H. Dunnington wishes to announce that he will not be associated with the Philadelphia College and Infirmary of Osteopathy as a member of the faculty the coming year, although his name appears in the catalogue of that institution.

Dr. Edythe Ashmore is now making an extensive tour of cities in the Pacific Coast states, and expects to gather a sufficient number of reports of cases from practitioners there to complete the material for series V of case reports, which she hopes to be able to publish soon.

Drs. L. C. Kingsbury, W. A. Willcox and A. U. Anderson, President, Secretary and Treasurer respectively, constitute the Osteopathic Board of Examiners for the State of Connecticut. They were appointed for a term of two years, beginning July 1, 1905. An examination will be held in Hartford Sept. 5, 1905. Blanks can be obtained of the Secretary.

Drs. S. A. and Irene Harwood Ellis have just returned to this country from an interesting voyage to the Orkney and Shetland Islands, Iceland, North Cape and Norway.

Before resuming their practice in Boston they will visit in St. Louis, Kansas Cty and Kirksville. They expected to reach home in time to attend a portion of the Denver meeting, but were disappointed—a disappointment felt the more keenly by Mrs. Ellis because it was the first meeting she had failed to attend.

Dr. Ella D. Still of Des Moines, Iowa, has been invited to act as chairman of a Bureau of Orificial Osteopathy and to help prepare the programme, so far as it relates to osteopathy, for the meeting of the American Association of Orificial Surgeons, which will be held in Chicago this fall in conjunction with Dr. E. H. Pratt's clinic.

Mrs. Still took the course in orificial surgery under Dr. Pratt three years ago. This is the third time that she has been asked to take a place on the programme of this Association, but heretofore she has been unable to attend. We consider this invitation not only a compliment to Dr. Still, but a notable recognition of osteopathy.

NEW MEMBERS.

List of those elected to membership in the American Osteopathic Association at the Denver meeting, Aug. 14-18, 1905:

Ernest C. Armstrong, 63½ Pollock St., Newbern, N. C.
N. B. Barnes, Meridian, Texas.
W. Frank Bates, 110 West Olive St., Ft. Collins, Col.
M. G. E. Bennett, Seventh and Willamette Sts., Eugene, Ore.
Ella F. Bissell, Wisconsin Building, Madison, Wis.
Bolling L. Blocker, 316 Miller Building, Chattanooga, Tenn.
Catherine M. Bowers, 141 S. Twelfth St., Lincoln, Neb.
Georgia W. Borup, Chamber of Commerce Building, St. Paul, Minn.
M. P. Browning, 539 S. Randolph St., Macomb, Ill.
Bertha A. Buddecke, 3230 S. Ninth St., St. Louis, Mo.
B. O. Burton, 506 Eighth Ave., Shenandoah, Iowa.
A. B. Clark, 750 Ellicott Square, Buffalo, N. Y.
H. L. Conner, 1411 Missouri Trust Building, St. Louis, Mo.
Helen Victoria Cooper, 369 Sutter St., San Francisco, Cal.
Charles Cornelius, Carthage, Mo.
Mrs. Charles Cornelius, Carthage, Mo.
Dale H. Craig, Harrisonville, Mo.
W. B. Ervin, Milledgeville, Ga.
Frank C. Farmer, 57 Washington St., Chicago, Ill.
Emily M. Fike, Suite 7, Florentine Building, Des Moines, Iowa.
Lamont H. Fisher, 505 Ninth St., Brooklyn, N. Y.
Wm. D. Fitzwater, 178 Prospect Park, West, Brooklyn, N. Y.
Elizabeth Frink, 92 Fourth St., Troy, N. Y.
Elmer T. Hall, Watertown, N. Y.
R. E. Hamilton, Kirksville, Mo.
Susan Orpha Harris, 1459 Franklin St., San Francisco, Cal.
Myrtle E. Herrman, 2024 Alameda Ave., Alameda, Cal.
Matthias Hook, South Ave., West, Kingman, Kan.
Emma Hoye, University Place, Neb.
C. E. Hulett, 308 West Sixth Ave., Topeka, Kan.
Anna Holme Hurst, 48 Ballenger Block, St. Joseph, Mo.
S. M. Kellogg, 203 South Main St., Rocky Ford, Col.
David Littlejohn, Freeport, Ill.
Morris Lychenheim, 507 Burton Block, 39 State St., Chicago, Ill.
Edward Mattocks, 764 Main St., Riverside, Cal.
Richard L. Meyer, 916 Market St., San Francisco, Cal.
F. M. Milliken, 221 East Tenth St., Grand Island, Neb.
Margaret B. Newman, 555 Fillmore St., San Francisco, Cal.
Mrs. Lou T. Noland, Carthage, Mo.
Mary E. Noonan, 214 Avenue E, San Antonio, Tex.
G. W. Pauly, De Graff Building, 118 N. Tejon St., Colorado Springs, Col.
Charles E. Peirce, Calgary Alberta, Ontario, Canada.
E. Anton Peterson, Safe Deposit Building, Seattle, Wash.
R. Annette Pluss, Broad St., Grove City, Pa.
George A. Pontius, 39 Main St., Lockport, N. Y.
William A. Potter, 65 Safe Deposit Building, Seattle, Wash.
R. B. Powell, Monte Visto, Col.
Millie Rhodes, 505 Ninth St., Brooklyn, N. Y.

Cara S. Richards, 121 Geary St., San Francisco, Cal.
T. J. Ruddy, Des Moines, Iowa.
Ernest M. Sasvil, Huntsville, Ala.
Lorena M. Schrock, 1540 I St., Bedford, Ind.
Dorothy D. Sellards, 769 Woodward Ave., Detroit, Mich.
John W. Shearer, Abilene, Kan.
Helga Skyberg, Tenth and Main Sts., Riverside, Cal.
William Snell, 1731 N. Prospect St., Tacoma, Wash.
Jennie Stephenson, 408 E. Sixteenth St., Los Angeles, Cal.
George A. Still, Kirksville, Mo.
Eugene Tiberghien, Agra, Kan.
C. E. Thompson, 1071 Twenty-second St., Des Moines, Iowa.
Neva T. Triplett, 1505 W. Main St., Enid, Okla.
W. S. Warner, Ft. Morgan, Col.
Benton A. Williams, Gallatin, Tenn.
George B. Ward, Montour, Iowa.
George H. Wood, 1957 Park Ave., Denver, Col.

REINSTATED.

Alice Heath Proctor, 897 Ellicott Square, Buffalo, N. Y.
D. M. Bodwell, Cripple Creek, Col.
Essie S. Cherry, Matthews Building, Milwaukee, Wis.
Harry M. Harris, 356 Ellicott Square, Buffalo, N. Y.
Frank Heine, Nixon Building, Pittsburg, Pa.
Harry G. DeTienne, 312 Central Block, Pueblo, Col.
A. P. Hibbs, Eccles Building, Ogden, Utah.
Louise F. Jennings, 308 N. Locust St., Centralia, Ill.
W. R. Laughlin, Los Angeles, Cal.
W. A. Sanders, 854 Clarkson St., Denver, Col.
Maude M. Sanders, 854 Clarkson St., Denver, Col.
W. W. Steele, 356 Ellicott Square, Buffalo, N. Y.
A. M. Wiles, Jerseyville, Ill.
A. H. Young, Merchants' Building, Pueblo, Col.

REMOVALS.

T. C. Morris, Memphis, Tenn., to St. Catherine, Mo.
C. A. and Elizabeth Broach, 379 Washington St., to 343 Capitol Ave., Atlanta, Ga.
A. Dean Glascock, Harrar Block, to 105 N. Washington St., Owosso, Mich.
Orella Locke, 55 Haddon Hall, to 11 Cumberland Building, Cincinnati, Ohio.
Harry M. Still, 19 E. Thirty-eighth St., to 18 W. Thirty-fourth St. New York City.
May Brevard, Shelbyville, Tenn., to Franklin, Ky.
Mary E. Taber, Medicine Lodge, Kansas, to 302 S. Fifth St., Kirksville, Mo.
V. P. Urbain, Tampa, Fla., to 111 Dayton St., Hamilton, Ohio.
Clara E. Sullivan, Wheeling, W. Va., to Kansas City, Mo.
Chas. H. Spencer, Des Moines, Iowa, to Los Angeles, Cal.
H. W. Forbes, Des Moines, Iowa, to Los Angeles, Cal.
Kate Crowhurst Slaughter, 823 Fulton St., to 1076 James Flood Building, San Francisco, Cal.
Geo. W. Perrin, 1635 E. Thirteenth Ave., to 18 Steele Block, Denver, Col.

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